

TABLE OF CONTENTS - 1130 MAINTENANCE DIAGNOSTICS

VOLUME 1			VOLUME 2			VOLUME 3			VOLUME 4			VOLUME 5 ***		
PROG. ID.	NAME	P/N	PROG. ID.	NAME	P/N	PROG. ID.	NAME	P/N	PROG. ID.	NAME	P/N	PROG. ID.	NAME	P/N
	TABLE OF CONTENTS	2191292	03B0	CORE STORAGE FUNCTION TEST			I/O TEST INDEX	2191291						
	CPU TEST INDEX	2191290	03B1											
03A1	CPU FUNCTION TEST		****			0300	DIAGNOSTIC MONITOR		0304	KEYBOARD/CONSOLE PRINTER TEST		0318	SCA INSTRUCTION FUNCTION TEST	
	DESCRIPTION	2191206		LISTING - HI CORE	2243964		DESCRIPTION	2191202		DESCRIPTION	2191242		DESCRIPTION	2243567
	LISTING	2191204		DECK/TAPE	2243965		LISTING	2191200		LISTING	2191240		LISTING	2243565
	** DECK/TAPE	2191205		DESCRIPTION	2243966		** DECK/TAPE	2191201		DECK/TAPE	2191241		DECK/TAPE	2243566
03A3	BASIC DIAGNOSTIC LOADER		03A4	METER TEST		0308	2315 DISK INITIALIZATION		0305	1627 PLOTTER FUNCTION TEST		0311	SCA WRT/RD BFR, LINE NOISE DETECTION	
	DESCRIPTION	2191254	****	DESCRIPTION	2191250		DESCRIPTION	2191218		DESCRIPTION	2191238		DESCRIPTION	2191274
	LISTING	2191252		LISTING	2191248		LISTING	2191216		LISTING	2191236		LISTING	2191272
	DECK/TAPE	2191253		DECK/TAPE	2191249		DECK/TAPE	2191217		DECK/TAPE	2191237		DECK/TAPE	2191273
03A5	ONE-CARD DIAGNOSTIC PROGRAMS		03A6	CORE STORAGE ADJUSTMENT TEST		0309	DISK STORAGE FUNCTION TEST		0308	1134/1055 FUNCTION TEST		0319	SCA WRAP AROUND TEST	
	DESCRIPTION	2191262	****	DESCRIPTION	2191246		DESCRIPTION	2191214		DESCRIPTION	2191234		DESCRIPTION	2243570
	LISTING	2191260		LISTING	2191244		LISTING	2191212		LISTING	2191232		LISTING	2243568
	DECK/TAPE	2191261		DECK/TAPE	2191245		DECK/TAPE	2191213		DECK/TAPE	2191233		DECK/TAPE	2243569
03A0	BASIC DIAGNOSTIC LOADER - 2501		03A8	INTERRUPT TEST		03AA	RELOCATING LOADER - 1442		030C	1132 PRINTER FUNCTION TEST		03AE	SCA TRANSMIT/RECEIVE - STR	
	DESCRIPTION	2243561	*	DESCRIPTION	2191270		DESCRIPTION	2191283		DESCRIPTION	2191222	****	DESCRIPTION	2191280
	LISTING	2243559		LISTING	2191268		LISTING	2191281		LISTING	2191220		LISTING	2191278
	DECK	2243560		** DECK/TAPE	2191269		DECK	2191282		DECK/TAPE	2191221		** DECK/TAPE	2191279
			030A	CE UTILITY PROGRAMS		03AB	RELOCATING LOADER - 2501		030F	1442 FUNCTION TEST		03AF	SCA DISPLAY PROGRAM	
			****				DESCRIPTION	****		DESCRIPTION	2191226	****	DESCRIPTION	2243564
				DISK ADJUSTMENT			LISTING	2191284		LISTING	2191224		LISTING	2243562
				DESC/LIST	2243957		DECK	2191285		DECK	2191225		** DECK/TAPE	2243563
				DECK/TAPE	2243958									
			03A0	SCOPE LOOPS		03AC	RELOCATING LOADER - PAPER TAPE		032F	1442 TIMING TEST		0317	SCA TRANSMIT/RECEIVE-BSC POINT TO POINT	
				DESC/LIST	2243962		DESCRIPTION	2191288		DESCRIPTION	2191230		DESCRIPTION	2243973
				DECK/TAPE	2243963		LISTING	2191286		LISTING	2191228		LISTING	2243971
							TAPE	2191287		DECK	2191229		DECK/TAPE	2243972
			0302	DIAL		0314	1231 FUNCTION TEST (NOTE 2)		030E	2501/1442-5 F.T.		031A	SCA TRANSMIT/RECEIVE-BSC MULTI POINT	
			****				DESCRIPTION	2243555		DESCRIPTION	2243552		DESCRIPTION	2243976
				DESCRIPTION	2243961		LISTING	2243553		LISTING	2243550		LISTING	2243974
				DECK/TAPE	2243960		DECK/TAPE	2243554		DECK/TAPE	2243551		DECK/TAPE	2243975
						0300	1403 PRINTER FUNCTION TEST			TEST CARDS	2243549			
							DESCRIPTION	2243558						
							LISTING	2243556						
							DECK/TAPE	2243557						

* THESE TESTS MUST USE THE BASIC DIAGNOSTIC LOADER: 03A3 OR 03A0
** TAPE CONTAINS THE P.T. LOADER
*** SUPPLIED ONLY ON SYSTEMS WITH A SYNCHRONOUS COMMUNICATIONS ADAPTER
**** USE RELOCATING LOADER 03AA, 03AB, OR 03AC
***** REFER TO P/N 2191283 (PID 03AA)

- NOTES:
- ALL TESTS IN VOLUMES 3, 4, AND 5 RUN UNDER CONTROL OF THE DIAGNOSTIC MONITOR: 0300, EXCEPT PID 03AE AND PID 03AF.
 - DOCUMENTATION IS PRESENT ONLY ON SYSTEMS WITH A 1231.

PID 037F SYS/7

DATE	EC NUMBER	DATE	EC NUMBER	TABLE OF CONTENTS
5NOV68	571005			MAINTENANCE DIAGNOSTICS
15JUL69	571013			DATE JUN 67 P/N 2191292
2AUG69	571053			TYPE .131
				IBM 03A1-0A

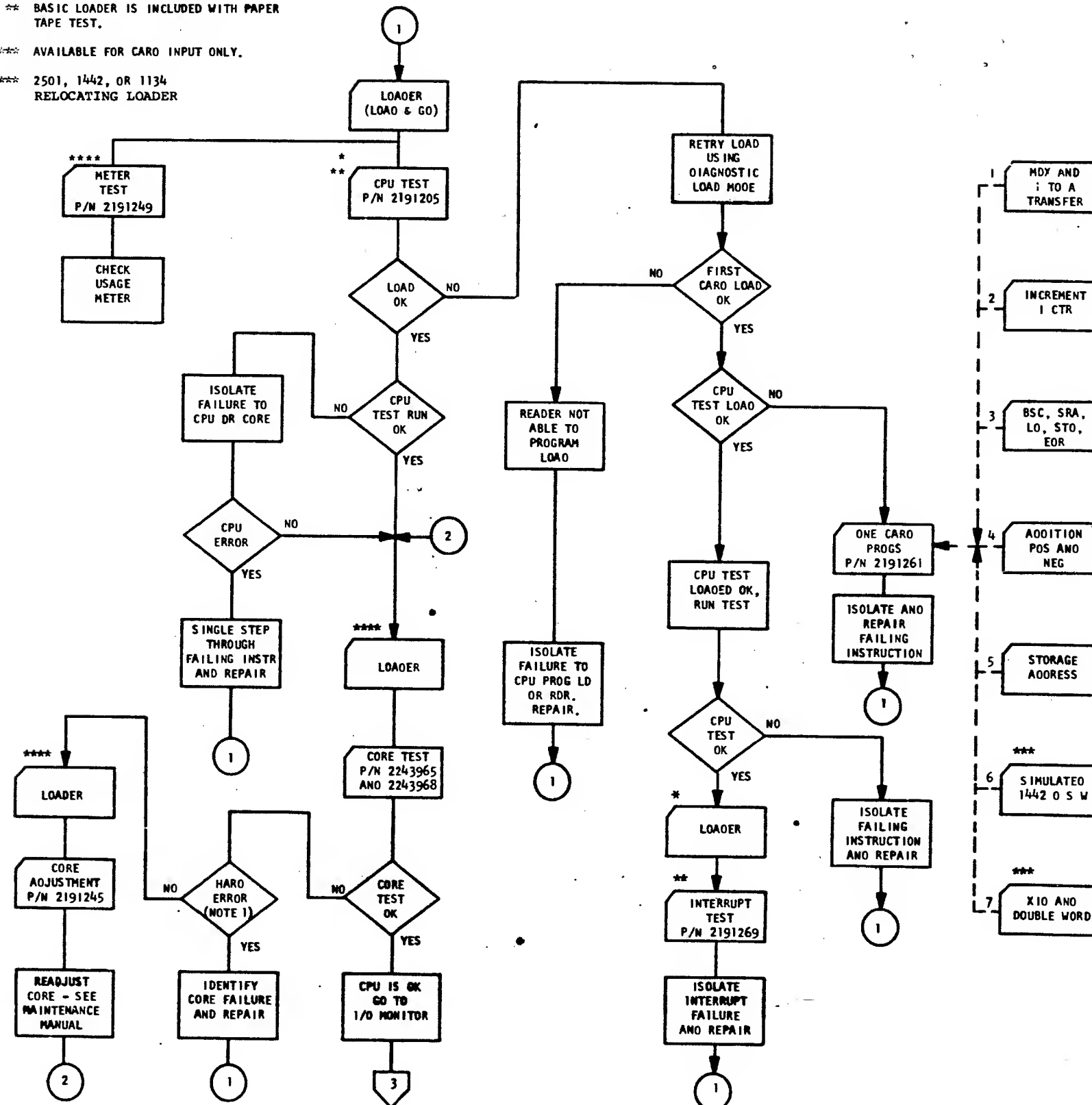
IBM MAINTENANCE DIAGNOSTIC PROGRAM FOR THE 1130 SYSTEM
CPU TEST INOEY

* 2501, 1442 OR 1134 BASIC LOADER.

** BASIC LOADER IS INCLUDED WITH PAPER TAPE TEST.

*** AVAILABLE FOR CARO INPUT ONLY.

**** 2501, 1442, OR 1134 RELOCATING LOADER



PART NO. 2191290

CPU NORMAL OPERATION SUMMARY

BASIC LOADER

1. LOAD AND GO MODE: PROVIDES NORMAL LOAD FOR CPU AND INTERRUPT TESTS.
2. DIAGNOSTIC MODE: USED ONLY WHEN LOAD AND GO MODE IS INOPERABLE, SEE DESCRIPTION FOR DIAGNOSTIC OPERATING INSTRUCTIONS.

CPU TEST

1. SET ALL CONSOLE BIT SWITCHES OFF.
2. LOAD BASIC LOADER FOLLOWED BY CPU TEST DECK AND TWO BLANK CAROS.
3. PROG WILL LOAD AND STOP WITH B REG AT 3000 ADDR. 012D.
4. SET ALL BIT SWITCHES TO FFFF AND PRESS PROG START.
5. PROG WILL STOP WITH B REG AT 3001 ADDR. 02B4.
6. SET SWITCHES OFF PRESS START.
7. PROG WILL HALT WITH B REG AT 3002 ADDR. 02C5. SEE 3.2 FOR OPTIONS AND PRESS START.
8. PROG WILL RUN APPROX 2 MIN. THEN STOP AT END OF TEST WITH B REG AT 3003 ADDR 0F62.
9. ERRORS ARE INDICATED BY ERROR WAITS, SEE DESCRIPTION SECT. 3.5.

CORE TEST

1. SET ALL CONSOLE BIT SWITCHES TO ZERO.
2. LOAD RELOCATING LOADER FOLLOWED BY HI CORE TEST DECK, LO CORE TEST DECK AND TWO BLANK CAROS.
3. HI CORE WILL LOAD, AND HALT WITH B REG AT 3001. THE CORE SIZE WILL BE IN THE ACCUMULATOR.
4. PRESS START. HI CORE WILL RUN 5 MIN. FOR EACH BK.
5. PRESS START. LO CORE WILL LOAD, HALT TO DISPLAY CORE SIZE, RUN APPROX. 2 MIN., THEN STOP AT END OF TEST WAIT 30FF, AT LOCATION 09CC.
6. ERRORS ARE INDICATED BY ERROR WAITS; SEE DESCRIPTION SECT. 3.5.

CORE ADJUSTMENT

1. USED ONLY WHEN A CORE VOLTAGE ADJUSTMENT IS NECESSARY. SEE DESCRIPTION.

ONE CARD PROGRAMS

1. USED ONLY WHEN PROGRAM LOAD IS FUNCTIONING, BUT THE BASIC DIAGNOSTIC LOADER IS UNABLE TO CORRECTLY LOAD THE CPU OR CORE TESTS. SEE DESCRIPTION FOR OPERATION.

INTERRUPT TEST

1. USED ONLY TO AID IN DIAGNOSING BASIC LOADER FAILURES IN LOAD AND GO MODE. SEE DESCRIPTION FOR OPERATION.

NOTE 1: A HARD ERROR IS A REPEATABLE ERROR WHICH IS CAUSED BY A HARDWARE FAILURE. A SOFT ERROR IS AN INTERMITTENT ERROR WHICH MAY BE CAUSED BY EITHER AN INTERMITTENT HARDWARE FAILURE OR BY MARGINAL CORE VOLTAGE ADJUSTMENT. THE DISTINCTION BETWEEN THE TWO IS DIFFICULT AND MUST BE LEFT TO THE DISCRETION OF THE INDIVIDUAL CE.

2: PART NUMBER IS THE SAME FOR BOTH CARO DECK OR PAPER TAPE PROGRAM. WHEN ORDERING SPECIFY CARO OR TAPE.

3: CONTROL OPTION BIT SWITCH SETTINGS ARE FOUND IN THE PROGRAM DESCRIPTION.

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE	1A
2. REQUIREMENTS	1A
2.1 PROGRAM REQUIREMENTS	
2.2 EQUIPMENT REQUIREMENTS	
3. USE PROCEDURE	1A
3.1 LOADING PROGRAM	
3.2 PROGRAM OPERATION	
3.3 TERMINATION	
3.4 RESTART PROCEDURE	
3.5 ERROR WAITS	
4. PRINTOUTS (NONE)	
5. COMMENTS	2A
6. APPENDIX (NONE)	

1. PURPOSE

THE PURPOSE OF THE 113D CENTRAL PROCESS UNIT FUNCTION TEST IS TO LOCATE FAILING INSTRUCTIONS. EACH SEPARATE CPU INSTRUCTION IS TESTED AND CHECKED FOR COMPLIANCE WITH THE PRODUCT SPECIFICATIONS. FEATURES THAT ARE NOT UNIQUE TO AN OPERATION CODE (INDEXING, INDIRECT ADDRESSING, ETC.) ARE ALSO TESTED. I/O RELATED FEATURES (INTERRUPT, CYCLE STEAL, ETC.) ARE NOT TESTED.

* PROGRAM RUNNING TIME *
* 2 USEC MACHINE - APPROXIMATELY 1 MINUTE *
* 4 USEC MACHINE - APPROXIMATELY 2 MINUTES *

2. PREREQUISITES

- 2.1 PROGRAM PREREQUISITES
- THE PROGRAM CAN BE OPERATED BY ITSELF BUT MUST BE LOADED BY THE 1130 BASIC DIAGNOSTIC LOADER.
- 2.2 EQUIPMENT PREREQUISITES
- A. 1130 PC HAVING 4096-WORD STORAGE.
B. CARO READER OR PAPER TAPE READER.

3. USE PROCEDURE

- 3.1 PROGRAM LOADING
- THE113D CPU FUNCTION TEST (D3A1) IS LOADED BY THE 1130 BASIC LOADER. SEE THE 113D BASIC LOADER DOCUMENTATION FOR THE DESCRIPTION OF THE LOADING PROCEDURE.
- 3.2 PROGRAM OPERATION

AFTER THE PROGRAM IS LOADED THE FOLLOWING NORMAL WAITS OCCUR,

LOCATION	B REG SYMBOLIC	DESCRIPTION AND ACTION
3DD0	(XDD0)	START OF PROGRAM. SET ALL BIT SWITCHES ON. PRESS START.
3D01	(XD01)	TESTING OF BIT SWITCHES ON COMPLETE, TURN OFF, PRESS START.
3D02	(XD03)	TESTING OF BIT SWITCHES OFF COMPLETE SET IN OPTION, PRESS START.
3003	(X007)	PROGRAM COMPLETED. PUSH START TO RERUN PROGRAM. IF OTHER WAITS OCCUR, REFER TO SECTION 3.5 FOR ERROR ISOLATION.

ANY WAITS OTHER THAN THOSE ABOVE ARE ERROR WAITS.

WHEN AN ERROR WAIT IS OBTAINED,

- SEE THE PROGRAM LISTING TO DETERMINE THE PROBLEM. ERROR WAITS ARE DOCUMENTED AT THE FRONT OF THE PROGRAM LISTING BY THE CONTENTS OF THE B REGISTER.
- IF THE ERROR WAIT HAS B REGISTER LESS THAN 3069, THE OPERATOR CANNOT LOOP ON THAT ERROR. INSTEAD, THE OPERATOR SHOULD SINGLE INSTRUCTION STARTING AT THE BEGINNING OF THE FAILING ROUTINE TO DETERMINE THE EXACT FAILURE. (SECTION 3.5)

3. IF THE ERROR WAIT HAS B REGISTER GREATER THAN 3D68, THE OPERATOR SHOULD, (SECTION 3.5)
- A. LOOP INSTRUCTION BEING TESTED (BIT SW 8 ON)
OR IF A LARGER LOOP IS DESIRED
LOCK ON ERROR (BIT SW 12 ON)
OR
LOOP ON ROUTINE (BIT SW 10 ON)
 - B. SINGLE STEP TO LOCATE THE EXACT FAILURE.
 - C. IF NO ERROR OCCURS, BYPASS THE ERROR WAIT (BIT SW 14 ON) AND USE A SCOPE TO DETERMINE THE FAILURE.

TABLE 1

DATA ENTRY SWITCHES																DESCRIPTION	
* 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
*																*	*
* NOTE- IF ERROR OCCURS, BITS 12 OR 8 MUST BE ON TO MAKE BIT 14 EFFECTIVE.																	*
*****																	*

3.3 TERMINATION

NORMAL TERMINATION OCCURS WITH PROGRAM STOPPING AT WAIT WITH B REG = 3003.

3.4 RESTART PROCEDURE

PRESS STOP, RESET, AND START BUTTONS.
ERROR WAITS

THERE ARE TWO TYPES OF ERROR CONDITIONS WHICH CAUSE ERROR WAITS.

1. ERRORS WHICH USE THE COMMON ERROR CONTROL ROUTINE (F000).
2. ERRORS WHICH OCCUR BEFORE SUFFICIENT PORTIONS OF THE HARDWARE HAVE BEEN CHECKED OUT TO ALLOW USE OF THE COMMON ERROR CONTROL ROUTINE.

ERRORS WHICH USE THE COMMON ERROR CONTROL ROUTINE HAVE B REG NUMBERS OF /3069 AND UP. WHEN A NUMBERED WAIT OCCURS, BITS 5-15 OF THE STORA (B REG = 3XXX). WHEN A NUMBERED WAIT OCCURS, BITS 5-15 OF THE STORAGE BUFFER REGISTER GIVE THE ERROR IDENTIFICATION NUMBER. TO FIND THE FAILING ROUTINE, LOOK IN THE ERROR IDENTIFICATION TABLE (IN FRUNT OF THE LISTING). THIS WILL GIVE YOU THE SYMBOLIC AND ACTUAL STARTING ADDRESS OF THE ROUTINE THAT FAILED.

ERRORS WHICH DO NOT USE THE COMMON ERROR CONTROL ROUTINE HAVE B REGISTER FROM /30D3 THRU /3068. THE INSTRUCTION REG WILL POINT DIRECTLY TO THE FAILING ROUTINE. TO FACILITATE FINDING THE START OF A TEST ROUTINE EACH TEST ROUTINE BEGINS WITH A LABEL HAVING AN A OR B AS ITS FIRST LETTER. IN THE LISTING EACH ROUTINE IS FURTHER BRACKETED BY A SOLID LINE OF ASTRISKS. TO FIND THE FAILING ROUTINE OF ERRORS WHICH DO NOT USE THE COMMON ERROR CONTROL START AT THE LOCATION SPECIFIED BY THE ERROR WAIT AND WORK UP THE LISTING (BACKWARDS) UNTIL THE FIRST SYMBOLIC LOCATION WHICH HAS A LABEL BEGINNING WITH A AND B. THIS IS THE START OF THE FAILING ROUTINE.

TWO WAYS OF LOCATING A FAILURE ARE AS FULLOWS-

- A. DETERMINE WHAT FAILURE CAUSED THE ERROR WAIT. TO LOCATE THE FAILURE, IT IS RECOMMENDED THAT THE PROGRAM BE MANUALLY ENTERED AT THE START OF THE FAILING ROUTINE AND SINGLE INSTRUCTION, FOLLOWING THE LISTING TO DETERMINE THE EXACT FAILURE.
- B. USE AN OSCILLOSCOPE TO HELP LOCATE THE FAILURE. IF THE FAILURE IS IN THE COMMON-ERROR ROUTINE, SIMPLY TURN ON CONSOLE ENTRY SWITCH B AND DEPRESS START PUSHBUTTON TO LOOP ON THE INSTRUCTION BEING TESTED. IF THE FAILURE IS IN THE FIRST PART OF THE PROGRAM (BEFORE THE COMMON ERROR ROUTINE INSTRUCTIONS HAVE BEEN CHECKED OUT), A BRANCH (MDX) TO THE BEGINNING OF THE ROUTINE MAY BE MANUALLY INSERTED IN PLACE OF THE WAIT INSTRUCTION. THEN, THE ROUTINE MAY BE LOOPED.

4. PRINTOUTS (NONE)

5. COMMENTS

THE 113D CPU FUNCTION TEST STARTS WITH VERY SIMPLE INSTRUCTIONS AND DETERMINES IF EACH INSTRUCTION PERFORMS TO SPECIFICATIONS. EACH SUCCESSIVE ROUTINE ATTEMPTS TO UTILIZE ONLY AN INSTRUCTION THAT HAS NOT BEEN PREVIOUSLY TESTED. THE PROGRAM OPTIONS PROVIDE A MEANS FOR CONTINUOUSLY LOOPING THE ENTIRE PROGRAM AND ALSO ALLOW FAILING ROUTINES TO BE LOOPED.

AN ATTEMPT IS MADE DURING THE EARLY STAGES OF THE PROGRAM TO DEVELOP THOSE INSTRUCTIONS WHICH ALLOW THE USAGE OF THE COMMON CONTROL (FDDE AND FD05) AND ERROR (F000) ROUTINES. AFTER THESE INSTRUCTIONS HAVE BEEN TESTED THE USER THEN HAS THE ABILITY TO REQUEST VARIOUS CONTROL OPTIONS BY MEANS OF THE DATA ENTRY SWITCHES.

5.1 OPERATING MODES

THE NORMAL MODE OF OPERATION IS WITH THE DATA ENTRY SWITCHES SET TO /0000. THIS CAUSES A SINGLE PASS THROUGH THE PROGRAM WITH AN ERROR WAIT OCCURING IF AN ERROR IS DETECTED.

IF AN ERROR IS DETECTED AND THE COMMON ERROR WAIT OCCURS, THE USER SHOULD TURN ON THE '' LOOP ON ROUTINE '' (DATA ENTRY SWITCHES SET TO /0020) AND SINGLE INSTRUCTION THROUGH THE FAILING ROUTINE TO ISOLATE THE FAILING INSTRUCTION.

IF THE FAILING ROUTINE DOES NOT FAIL WHEN EXECUTED IN SINGLE INSTRUCTION MODE, THE USER CAN TURN ON THE '' BYPASS ERROR WAIT'' SWITCH AND THE ''LOOP ROUTINE'' SWITCH (DATA ENTRY SWITCHES SET TO /0022) AND PROCEED TO USE SCOPING TECHNIQUES TO ISOLATE THE FAILURE.

5.2 PROGRAM LABELS

LABELS OCCURING IN THE PROGRAM LISTING CAN BE QUICKLY IDENTIFIED AS FOLLOWS-

- A. LABELS STARTING WITH A OR B INDICATE THE BEGINNING OF A TEST ROUTINE.
- B. LABELS STARTING WITH G, H, J, OR K INDICATE COMMUNICATION LABELS WITH A ROUTINE.
- C. LABELS STARTING WITH V OR X ARE RESERVED FOR WAITS.
- D. LABELS STARTING WITH N, R, OR S INDICATE A CONSTANT UR WORK AREA.
- E. LABELS STARTING WITH F, W, Z OR U ARE USED IN COMMON OR SPECIAL ROUTINES THAT ARE NOT A REGULAR TEST ROUTINE.

6. APPENDIX (NONE)

----- LAST PAGE -----

```

0000          ABS          /3000          3A100020
          ORG          3A100030
          *****3A100040
          *          3A100050
          *          3A100060
          *          3A100070
          *          3A100080
          *          3A100090
          *          3A100100
          *          3A100110
          *          3A100120
          *          3A100130
          *          3A100140
          *          3A100150
          *          3A100160
          *          3A100170
          *          3A100180
          *          3A100190
          *          3A100200
          *****3A100210
          *          3A100220
          *          OPERATING INSTRUCTIONS
          *          3A100230
          *          3A100240
          *          BIT SWITCH SETTINGS
          *          3A100250
          *          3A100260
          *          BIT 14 ON BYPASS ERROR WAIT
          *          3A100270
          *          3A100280
          *          BIT 12 OR 8 MUST BE ON TO
          *          MAKE BIT 14 EFFECTIVE.
          *          3A100300
          *          3A100310
          *          BIT 13 NOT USED
          *          3A100320
          *          3A100330
          *          BIT 12 LOCK ON ERROR
          *          3A100340
          *          3A100350
          *          BIT 11 ON LOOP PROGRAM
          *          3A100360
          *          3A100370
          *          BIT 10 ON LOOP ROUTINE
          *          3A100380
          *          3A100390
          *          BIT 9 NOT USED
          *          3A100400
          *          3A100410
          *          BIT 8 LOOP ON INSTRUCTION BEING
          *          TESTED
          *          3A100420
          *          3A100430
          *          BIT 7 ON BYPASS MPL/OIV TEST
          *          3A100440
          *          3A100450
          *          3A100460
          *          3A100470
          *          3A100480
          *          3A100490
          *          3A100500
          *          3A100510
          *          3A100520
          *          3A100530
          *****3A100540
          *          3A100550
          8-REG 1-REG          A HALT AT          3A100560
          *****3A100570
          *          3A100580
          3000 0 012E          OC          X000E1          1130 AND 1800
          *          SET DATA ENTRY SWITCHES
          *          TO /FFFF & PRESS START
          *          3A100590
          *          3A100600
          *          3A100610
          *          X1800H ALSO SET S/P SWS TO
          *          /FF00 AND PRESS START
          *          3A100620
          *          3A100630
          *          3A100640
          3001 0 0285          OC          X001E1          3A100650
          *          SET SENSE/PROG AND
          *          DATA ENTRY SWITCHES
          *          TO ZEROS AND PRESS
          *          START
          *          3A100660
          *          3A100670
          *          3A100680
          *          3A100690
          *          3A100700

```

```

3002 0 02C6          *      OC      X003E1      SET SWITCHES FOR OPTIONS      3A100700
                        *                                AND PRESS START      3A100710
                        *                                3A100720
3003 0 0F63          *      OC      X007E1      PROGRAM COMPLETED      3A100730
                        *                                3A100740
                        *                                3A100750
                        *                                3A100760
                        *      ERROR IDENTIFICATION LISTING      3A100770
                        *                                3A100780
                        *                                3A100790
                        *                                3A100800
                        *                                3A100810
*****              *****              3A100820
      ADDRESS      *                                3A100830
      OF          *                                3A100840
8-REG ROUTINE      * A REG Q REG XR-1 XR-2 XR-3 STATUS      3A100850
*****              *****              3A100860
3004 0 012E          *      OC      A080      MOX      3A100870
                        * SHORT FORM MOX FAILED TO MODIFY I CTR &1      3A100880
                        *                                3A100890
                        *                                3A100900
3005 0 012E          *      OC      A080      MOX      MOOE0      3A100910
3006 0 012E          *      OC      A080      MOX      E1      3A100920
                        * SHORT FORM MOX-SHOULD HAVE MODIFIED I CTR      3A100930
                        * &2 BUT MODIFIED BY 0 OR &1      3A100940
                        *                                3A100950
                        *                                3A100960
3007 0 012E          *      OC      A080      MOX      MOOE0      3A100970
3008 0 012E          *      OC      A080      MOX      E1      3A100980
3009 0 012E          *      OC      A080      MOX      E2      3A100990
300A 0 012E          *      OC      A080      MOX      E3      3A101000
                        * SHORT FORM MOX SHOULD HAVE MODIFIED I CTR      3A101010
                        * &4 BUT MODIFIED BY 0, &1, &2 OR &3      3A101020
                        *                                3A101030
                        *                                3A101040
                        *                                3A101050
3008 0 012E          *      OC      A080      MOX      3A101060
                        * MOX SHORT FORM FAILED TO MODIFY I CTR      3A101070
                        *                                3A101080
                        *                                3A101090
300C 0 012E          *      DC      A080      MOX      MOOE0      3A101100
300D 0 012E          *      OC      A080      MOX      E1      3A101110
300E 0 012E          *      OC      A080      MOX      E2      3A101120
                        * MOX SHORT FORM-SHOULD HAVE MODIFIED I CTR      3A101130
                        * -2, 010 MODIFY BY 0, &1 OR &2      3A101140
                        *                                3A101150
                        *                                3A101160
300F 0 013F          *      OC      A0C0      BSC,C      3A101170
                        * N/A      N/A      N/A      N/A      N/A      C&0      3A101180
                        * BSC SKIPPED-SHOULD NOT HAVE      3A101190
                        *                                3A101200
                        *                                3A101210
3010 0 013F          *      OC      A0C0      BSC,C      3A101220
3011 0 013F          *      OC      A0C0      BSC,C      3A101230
                        * N/A      N/A      N/A      N/A      N/A      C&0 AFTER LOS      3A101240
                        * N/A      N/A      N/A      N/A      N/A      C AFTER 1ST BSC      3A101250
                        * FIRST BSC SKIPPED-SHOULD NOT HAVE      3A101260
                        * SECOND BSC FAILED TO SKIP-INDICATING 1ST BSC      3A101270
                        * FAILED TO TURN OFF OVERFLOW      3A101280
                        *                                3A101290
                        *                                3A101300
3012 0 013F          *      OC      A0C0      BSC,C      3A101310
                        * N/A      N/A      N/A      N/A      N/A      OFF      3A101320
                        * BSC 010 NOT SKIP WITH OVERFLOW OFF      3A101330
                        *                                3A101340
                        *                                3A101350
3013 0 014C          *      OC      A100      LO      3A101360
                        * 0000      N/A      N/A      N/A      N/A      N/A      3A101370
                        * ACCUM NOT EQUAL TO 0000

```


*****3A102740
ADDRESS * 3A102750
OF * 3A102760
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A102770
*****3A102780
3045 0 01F5 OC A100 SRA & EOR 3A102790
* 7FFF N/A N/A N/A N/A N/A S/B AFTER SRA 3A102800
* 0000 N/A N/A N/A N/A N/A S/B AFTER EOR 3A102810
* WITH ACCM EQUAL 7FFF AN EOR USING 7FFF 010 NCT 3A102820
* RESULT IN ACCM EQUAL TO 0000 3A102830
* RESULT IN ACCM EQUAL TO 0000 3A102840
* 3A102850
3046 0 0214 OC A1E0 LO LONG FGRM 3A102860
* 0000 N/A N/A N/A N/A N/A S/B AFTER LO 3A102870
* ACCM NOT EQUAL 0000-INDICATING WRONG 3A102880
* LOCATION WAS LOADED 3A102890
* 3A102900
* 3A102910
3047 0 0214 OC A1E0 LO LONG FORM 3A102920
* C,N1E0. N/A N/A N/A N/A N/A S/B AFTER LO 3A102930
* 0000 N/A N/A N/A N/A N/A S/B AFTER EOR 3A102940
* ACCM NET EQUAL 0000 INDICATING WRONG LOCATION 3A102950
* WAS LOADED 3A102960
* 3A102970
* 3A102980
3048 0 0220 OC A1F0 LO INO 3A102990
3049 0 0220 OC A1F0 LO INO 3A103000
* 0000 N/A N/A N/A N/A N/A S/B FOR BSC 3A103010
* ACCM NOT EQUAL 0000 INDICATING WRONG 3A103020
* LOCATION WAS LOADED 3A103030
* 3A103040
* 3A103050
304A 0 0220 OC A200 BSC LONG FORM 3A103060
* UNCONDITIONAL BSC DIO NOT BRANCH 3A103070
* 3A103080
* 3A103090
304B 0 0220 OC A200 BSC LONG FORM 3A103100
* UNCONDITIONAL BSC SKIPPED-SHOULD BRANCH 3A103110
* 3A103120
* 3A103130
304C 0 0220 OC A200 BSC,E LONG FORM 3A103140
304D 0 0220 OC A200 3A103150
* FFFF N/A N/A N/A N/A N/A 3A103160
* BSC FELL THRU OR SKIPPED-SHOULD BRANCH 3A103170
* DIO NOT SKIP OR SKIPPED - SHOULD BR. 3A103180
* 3A103190
304E 0 0220 OC A200 BSC,E LONG FORM 3A103200
304F 0 0220 OC A200 3A103210
* FFFF N/A N/A N/A N/A N/A S/B AT TEST 3A103220
* DIO NOT SKIP OR SKIPPED - SHOULD BR. 3A103230
* 3A103240
* 3A103250
3050 0 0220 OC A200 BSC,Z LONG FORM 3A103260
3051 0 0220 OC A200 3A103270
* FFFF N/A N/A N/A N/A N/A S/B AT TEST 3A103280
* BSC DIO NOT SKIP OR SKIPPED - SHOULD BR. 3A103290
* 3A103300
* 3A103310
3052 0 0220 OC A200 BSC,- LONG FORM 3A103320
* FFFF N/A N/A N/A N/A N/A S/B AT TEST 3A103330
* BSC BRANCHED-SHOULD NOT 3A103340
* 3A103350
* 3A103360
3053 0 0220 OC A200 BSC,C LONG FORM 3A103370
3054 0 0220 OC A200 3A103380
* N/A N/A N/A N/A N/A C&O S/B AT TEST 3A103390
* BSC DIO NOT SKIP OR SKIPPED-SHOULD BRANCH 3A103400
* 3A103410

*****3A103420
ADDRESS * 3A103430
OF * 3A103440
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A103450
*****3A103460
3055 0 0220 OC A200 BSC,D LONG FORM 3A103470
3056 0 0220 OC A200 3A103480
* N/A N/A N/A N/A N/A C&O S/B AT TEST 3A103490
* BSC DIO NOT SKIP OR SKIPPED-SHOULD BRANCH 3A103500
* 3A103510
* 3A103520
3057 0 0220 OC A200 BSC,D LONG FORM 3A103530
* N/A N/A N/A N/A N/A C S/B AT TEST 3A103540
* BSC FAILED TO TURN OFF OVERFLOW 3A103550
* 3A103560
* 3A103570
3058 0 0220 OC A200 BSC,C LONG FORM 3A103580
* N/A N/A N/A N/A N/A OFF S/B AT TEST 3A103590
* BSC BRANCHED-SHOULD NOT 3A103600
* 3A103610
* 3A103620
3059 0 0220 OC A200 BSC,D LONG FORM 3A103630
* N/A N/A N/A N/A N/A OFF S/B AT TEST 3A103640
* BSC BRANCHED-SHOULD NOT 3A103650
* 3A103660
* 3A103670
305A 0 0220 OC A200 BSC,E- LONG FORM 3A103680
305B 0 0220 OC A200 3A103690
* 0000 N/A N/A N/A N/A N/A 3A103700
* BSC DIO NOT SKIP OR SKIPPED-SHOULD BRANCH 3A103710
* 3A103720
* 3A103730
305C 0 0220 OC A200 BSC,E- LONG FORM 3A103740
* FFFF N/A N/A N/A N/A N/A S/B AT TEST 3A103750
* BSC BRANCHED-SHOULD NOT 3A103760
* 3A103770
* 3A103780
305D 0 0220 OC A200 BSC,E- LONG FORM 3A103790
* 0001 N/A N/A N/A N/A N/A S/B AT TEST 3A103800
* BSC BRANCHED SHOULD NOT 3A103810
* 3A103820
* 3A103830
305E 0 0220 OC A200 BSC INDIRECT 3A103840
305F 0 0220 OC A200 3A103850
* BSC DIO NOT SKIP OR SKIPPED-SHOULD BRANCH 3A103860
* 3A103870
* 3A103880
3060 0 0270 OC A240 BSI 3A103890
* UNCONDITIONAL BSI DIO NOT BRANCH 3A103900
* 3A103910
* 3A103920
3061 0 0270 OC A240 BSI 3A103930
* UNCONDITIONAL BSI DIO NOT STORE I CTR 3A103940
* CORRECTLY 3A103950
* 3A103960
* 3A103970
3062 0 0270 OC A240 BSI,E LONG FORM 3A103980
3063 0 0270 OC A240 3A103990
* 0000 N/A N/A N/A N/A N/A S/B AT TEST 3A104000
* BSI DIO NOT SKIP OR SKIPPED-SHOULD BRANCH 3A104010
* 3A104020
* 3A104030
3064 0 0270 OC A240 BSI,E LONG FORM 3A104040
* BSI DIO NOT STORE THE I CTR CORRECTLY 3A104050
* 3A104060
* 3A104070
3065 0 02B2 OC A900 STORE 3A104080
* STORE INSTRUCTION FAILED 3A104090


```
*****3A104100
ADDRESS * 3A104110
OF * 3A104120
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A104130
*****3A104140
3066 0 0282 OC A900 XIO SENSE/PROG SWS 3A104150
* FF00 N/A N/A N/A N/A S/8 AT TEST 3A104160
* ACCUM NOT EQUAL TO FF00-- SENSE/PROG SWS 3A104170
* WERE INCORRECTLY SENSED 3A104180
* 3A104190
3067 0 0282 DC A900 XIO DATA ENTRY SWS 3A104200
* FF00 N/A N/A N/A N/A S/8 AT TEST 3A104210
* ACCUM NOT EQUAL TO FFFF-- DATA ENTRY SWS 3A104220
* WERE INCORRECTLY READ 3A104230
* 3A104240
3068 0 0282 DC A900 XIO SENSE/PROG SWS 3A104250
* FF00 N/A N/A N/A N/A S/8 AT TEST 3A104260
* ACCUM NOT EQUAL TO 0000-- SENSE/PROG SWS 3A104270
* WERE INCORRECTLY SENSED 3A104280
* 3A104290
3069 0 0282 DC A900 XIO 3A104300
* 0000 N/A N/A N/A N/A NT/8 AT TEST 3A104310
* ACCUM NOT EQUAL TO 0000--DATA ENTRY SWS 3A104320
* WERE INCORRECTLY READ 3A104330
* 3A104340
* 3A104350
* 3A104360
* 3A104370
* 3A104380
* 3A104390
*****3A104400
* 3A104410
* THE FOLLOWING ERRORS ARE HANDLED BY THE 3A104420
* COMMON ERROR CONTROL ROUTINE. THE ID NUMBER 3A104430
* SHOWN FOR EACH ERROR WILL APPEAR IN 81TS 3A104440
* 5 THRU 15 OF THE WAIT INSTRUCTION. 3A104450
* 3A104460
*****3A104470
* 3A104480
306A 0 0208 OC A280 SRA 16 3A104490
* FFFF N/A N/A N/A N/A S/8 AFTER LD 3A104500
* 0000 N/A N/A N/A N/A S/8 AFTER SRA 3A104510
* ACCUM NOT ZERO 3A104520
* 3A104530
3068 0 02E2 DC A281 SRA 15 3A104540
* 8000 N/A N/A N/A N/A S/8 AFTER LD 3A104550
* 0001 N/A N/A N/A N/A S/8 AFTER SRA 3A104560
* ACCUM NOT EQUAL 0001 3A104570
* 3A104580
306C 0 02E0 DC A282 SRA 1 3A104590
* AAAA N/A N/A N/A N/A S/8 AFTER LD 3A104600
* 5555 N/A N/A N/A N/A S/8 AFTER SRA 3A104610
* ACCUM NOT EQUAL 5555 3A104620
* 3A104630
3060 0 02F8 DC A283 SRA 1 3A104640
* 5555 N/A N/A N/A N/A S/8 AFTER LD 3A104650
* 2AAA N/A N/A N/A N/A S/8 AFTER SRA 3A104660
* ACCUM NOT EQUAL 2AAA 3A104670
* 3A104680
306E 0 0303 DC A284 SERIES OF SRAS-15 3A104690
* *TOTAL SHIFTS 3A104700
* 8000 N/A N/A N/A N/A S/8 AFTER LD 3A104710
* 0001 N/A N/A N/A N/A S/8 AFTER SRA 3A104720
* ACCUM NOT EQUAL 0001 3A104730
* 3A104740
* 3A104750
* 3A104760
* 3A104770
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PROG ID 03A1-1
PAGE 4

```
*****3A104780
ADDRESS * 3A104790
OF * 3A104800
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A104810
*****3A104820
306F 0 0318 DC A2C0 AND-MEMORY#0000 3A104830
* 0000 N/A N/A N/A N/A S/8 AFTER LD 3A104840
* 0000 N/A N/A N/A N/A AFTER AND 3A104850
* ACCUM NOT EQUAL 0000 3A104860
* 3A104870
3070 0 0322 DC A2C4 AND-MEMORY#FFFF 3A104880
* 0000 N/A N/A N/A N/A 3A104890
* 0000 N/A N/A N/A N/A 3A104900
* ACCUM NOT EQUAL 0000 3A104910
* 3A104920
3071 0 032C OC A2C8 AND-MEMORY#0000 3A104930
* FFFF N/A N/A N/A N/A 3A104940
* 0000 N/A N/A N/A N/A 3A104950
* ACCUM NOT EQUAL 0000 3A104960
* 3A104970
3072 0 0336 OC A2CC AND-MEMORY#FFFF 3A104980
* FFFF N/A N/A N/A N/A 3A104990
* FFFF N/A N/A N/A N/A 3A105000
* ACCUM NOT EQUAL FFFF 3A105010
* 3A105020
3073 0 0344 DC A300 OR-MEMORY # 0000 3A105030
* 0000 N/A N/A N/A N/A AFTER LD&OR 3A105040
* 0000 N/A N/A N/A N/A AFTER EOR 3A105050
* ACCUM NOT EQUAL 0000 3A105060
* 3A105070
3074 0 034E OC A302 OR-MEMORY#FFFF 3A105080
* 0000 N/A N/A N/A N/A AFTER LD & OR 3A105090
* FFFF N/A N/A N/A N/A AFTER EOR 3A105100
* ACCUM NOT EQUAL FFFF 3A105110
* 3A105120
3075 0 0359 DC A304 OR-MEMORY#FFFF 3A105130
* FFFF N/A N/A N/A N/A AFTER LD&OR 3A105140
* 0001 N/A N/A N/A N/A AFTER EOR 3A105150
* ACCUM NOT EQUAL FFFF 3A105160
* 3A105170
3076 0 0367 DC A340 RTE 16 3A105180
* FFFF 0000 N/A N/A N/A BEFORE RTE 3A105190
* 0000 FFFF N/A N/A N/A AFTER RTE 3A105200
* ACCUM NOT EQUAL 0000 3A105210
* 3A105220
3077 0 0367 OC A340 RTE 16 3A105230
* 0000 FFFF N/A N/A N/A BEFORE RTE 3A105240
* FFFF 0000 N/A N/A N/A AFTER RTE 3A105250
* ACCUM NOT EQUAL FFFF 3A105260
* 3A105270
3078 0 0380 DC A380 SRT 32 3A105280
* 8000 N/A N/A N/A N/A BEFORE SRT 3A105290
* FFFF FFFF N/A N/A N/A AFTER SRT 3A105300
* ACCUM NOT EQUAL FFFF 3A105310
* 3A105320
* 3A105330
* 3A105340
* 3A105350
* 3A105360
* 3A105370
* 3A105380
* 3A105390
* 3A105400
* 3A105410
* 3A105420
* 3A105430
* 3A105440
* 3A105450
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PROG ID 03A1-1
PAGE 4A


```
*****3A105460
ADDRESS * 3A105470
OF * 3A105480
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A105490
*****3A105500
* 3A105510
3079 0 0380 OC A380 SRT 32 & RTE 16 3A105520
* 8000 N/A N/A N/A N/A N/A BEFORE SRT 3A105530
* FFFF FFFF N/A N/A N/A N/A AFTER SRT&RTE 3A105540
* ACCUM NOT EQUAL FFFF-INDICATING Q REG FAILED 3A105550
* 3A105560
* 3A105570
307A 0 0395 OC A384 SRT 32 3A105580
* 4000 N/A N/A N/A N/A N/A AFTER LD 3A105590
* 0000 0000 N/A N/A N/A N/A AFTER SRT 3A105600
* ACCUM NOT EQUAL 0000 3A105610
* 3A105620
* 3A105630
3078 0 0395 DC A384 SRT 32 & RTE 16 3A105640
* 4000 N/A N/A N/A N/A N/A AFTER LD 3A105650
* 0000 0000 N/A N/A N/A N/A AFTER SRT 3A105660
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A105670
* 3A105680
* 3A105690
307C 0 03A8 OC A388 SRT 15 3A105700
* 5555 N/A N/A N/A N/A N/A AFTER LD 3A105710
* 0000 AAAA N/A N/A N/A N/A AFTER SRT 3A105720
* ACCUM NOT EQUAL 0000 3A105730
* 3A105740
* 3A105750
307D 0 03A8 OC A388 SRT 15 & RTE 16 3A105760
* 5555 N/A N/A N/A N/A N/A AFTER LD 3A105770
* 0000 AAAA N/A N/A N/A N/A AFTER SRT 15 3A105780
* AAAA 0000 N/A N/A N/A N/A AFTER RTE 16 3A105790
* ACCUM NOT EQUAL AAAA-INDICATING Q REG FAILED 3A105800
* 3A105810
* 3A105820
307E 0 03BC OC A38C SERIES OF SRTS-30 3A105830
* *TOTAL SHIFTS 3A105840
* 5555 N/A N/A N/A N/A N/A AFTER LD 3A105850
* 0000 0001 N/A N/A N/A N/A AFTER SRT&S 3A105860
* ACCUM NOT EQUAL 0000 3A105870
* 3A105880
* 3A105890
307F 0 038C DC A38C SERIES OF SRTS-30 3A105900
* *TOTAL SHIFTS & 3A105910
* *RTE 16 3A105920
* 5555 N/A N/A N/A N/A N/A AFTER LD 3A105930
* 0000 0001 N/A N/A N/A N/A AFTER SRT&S 3A105940
* 0001 0000 N/A N/A N/A N/A AFTER RTE 16 3A105950
* ACCUM NOT EQUAL 0001-INDICATING Q REG FAILED 3A105960
* 3A105970
* 3A105980
* 3A105990
3080 0 03DC DC A3C0 RTE 15 3A106000
* 5555 AAAA N/A N/A N/A N/A AFTER LD&S 3A106010
* 5554 AAAB N/A N/A N/A N/A AFTER RTE 15 3A106020
* ACCUM NOT EQUAL 5554 - RTE 15 Q TO A FAILED 3A106030
* 3A106040
* 3A106050
3081 0 030C OC A3C0 RTE 15 & RTE 16 3A106060
* 5555 AAAA N/A N/A N/A N/A AFTER LD&S 3A106070
* 5554 AAAB N/A N/A N/A N/A AFTER RTE 15 3A106080
* AAAB 5554 N/A N/A N/A N/A AFTER RTE 16 3A106090
* ACCUM NOT EQUAL AAAB-INDICATING Q REG FAILED 3A106100
* 3A106110
* 3A106120
* 3A106130
```

```
*****3A106140
ADDRESS * 3A106150
OF * 3A106160
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A106170
*****3A106180
3082 0 03F3 DC A3C4 SERIES OF RTEs-31 3A106190
* *TOTAL SHIFTS 3A106200
* 0000 8000 N/A N/A N/A N/A AFTER LD 3A106210
* 0001 0000 N/A N/A N/A N/A AFTER RTE&S 3A106220
* ACCUM NOT EQUAL 0001 3A106230
* 3A106240
* 3A106250
3083 0 03F3 DC A3C4 SERIES OF RTEs-31 3A106260
* *TOTAL SHIFTS 3A106270
* *FOLLOWED BY RTE 16 3A106280
* 0000 8000 N/A N/A N/A N/A AFTER LD 3A106290
* 0001 0000 N/A N/A N/A N/A AFTER RTE&S 3A106300
* 0000 0001 N/A N/A N/A N/A AFTER RTE 16 3A106310
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A106320
* 3A106330
* 3A106340
3084 0 0412 OC A400 SLA 16 3A106350
* FFFF FFFF N/A N/A N/A N/A AFTER LD 3A106360
* 0000 FFFF N/A N/A N/A N/A AFTER SLA 3A106370
* ACCUM NOT EQUAL 0000 3A106380
* 3A106390
* 3A106400
3085 0 0412 OC A400 SLA 16 3A106410
* FFFF FFFF N/A N/A N/A OFF AFTER LD 3A106420
* 0000 FFFF N/A N/A N/A C AFTER SLA 3A106430
* CARRY NOT SET 3A106440
* 3A106450
* 3A106460
3086 0 0412 OC A400 SLA 16 & RTE 16 3A106470
* FFFF FFFF N/A N/A N/A N/A AFTER LD 3A106480
* 0000 FFFF N/A N/A N/A N/A AFTER SLA 3A106490
* FFFF 0000 N/A N/A N/A N/A AFTER RTE 16 3A106500
* ACCUM NOT EQUAL FFFF-INDICATING Q REG FAILED 3A106510
* 3A106520
* 3A106530
3087 0 0433 OC A408 SLA 16 3A106540
* 0001 0000 N/A N/A N/A N/A AFTER LD 3A106550
* 0000 0000 N/A N/A N/A N/A AFTER SLA 3A106560
* ACCUM NOT EQUAL 0000 3A106570
* 3A106580
* 3A106590
3088 0 0433 OC A408 SLA 16 3A106600
* 0001 0000 N/A N/A N/A N/A AFTER LD 3A106610
* 0000 0000 N/A N/A N/A N/A AFTER SLA 3A106620
* CARRY NOT SET 3A106630
* 3A106640
* 3A106650
3089 0 0433 OC A408 SLA 16 & RTE 16 3A106660
* 0001 0000 N/A N/A N/A N/A AFTER LD 3A106670
* 0000 0000 N/A N/A N/A N/A AFTER SLA 3A106680
* 0000 0000 N/A N/A N/A N/A AFTER RTE 16 3A106690
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A106700
* 3A106710
* 3A106720
308A 0 0453 DC 8400 SLA 1 3A106730
* AAAA 0000 N/A N/A N/A N/A AFTER LD 3A106740
* 5554 0000 N/A N/A N/A N/A AFTER SLA 3A106750
* ACCUM NOT EQUAL 5554 3A106760
* 3A106770
* 3A106780
* 3A106790
* 3A106800
* 3A106810
```

```
*****3A106820
ADDRESS * 3A106830
OF * 3A106840
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A106850
*****3A106860
3088 0 0453 OC 8400 SLA 1 3A106870
* AAAA 0000 N/A N/A N/A C 3A106880
* 5554 0000 N/A N/A N/A C 3A106890
* CARRY NOT SET 3A106900
* 3A106910
* 3A106920
308C 0 0453 OC 8400 SLA 1 & RTE 16 3A106930
* AAAA 0000 N/A N/A N/A N/A 3A106940
* 5554 0000 N/A N/A N/A N/A 3A106950
* 0000 5554 N/A N/A N/A N/A AFTER RTE 3A106960
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A106970
* 3A106980
* 3A106990
3080 0 0471 OC 8406 SLA 1 3A107000
* 5555 0000 N/A N/A N/A N/A AFTER LO 3A107010
* AAAA 0000 N/A N/A N/A N/A AFTER SLA 3A107020
* ACCUM NOT EQUAL AAAA 3A107030
* 3A107040
* 3A107050
308E 0 0471 OC 8406 SLA 1 3A107060
* 5555 0000 N/A N/A N/A C AFTER LO 3A107070
* AAAA 0000 N/A N/A N/A OFF AFTER SLA 3A107080
* CARRY SET-SHOULD BE CLEAR 3A107090
* 3A107100
* 3A107110
308F 0 0471 OC 8406 SLA 1 & RTE 16 3A107120
* 5555 0000 N/A N/A N/A N/A AFTER LO 3A107130
* AAAA 0000 N/A N/A N/A N/A AFTER SLA 3A107140
* 0000 AAAA N/A N/A N/A N/A AFTER RTE 3A107150
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A107160
* 3A107170
* 3A107180
3090 0 0490 DC 840A SERIES OF SLAS-16 3A107190
* *TOTAL SHIFTS 3A107200
* 0001 0000 N/A N/A N/A N/A AFTER SLA 0 3A107210
* 0000 0000 N/A N/A N/A N/A AFTER SLA2S 3A107220
* ACCUM NOT EQUAL 0000 3A107230
* 3A107240
* 3A107250
3091 0 0490 OC 840A SERIES OF SLAS-16 3A107260
* *TOTAL SHIFTS 3A107270
* 0001 0000 N/A N/A N/A C AFTER SLA 0 3A107280
* 0000 0000 N/A N/A N/A C AFTER SLA2S 3A107290
* CARRY NOT SET 3A107300
* 3A107310
* 3A107320
3092 0 0490 DC 840A SERIES OF SLAS-16 3A107330
* *TOTAL SHIFTS & 3A107340
* *RTE 16 3A107350
* 0001 0000 N/A N/A N/A N/A AFTER SLA 0 3A107360
* 0000 0000 N/A N/A N/A N/A AFTER SLA2S 3A107370
* 0000 0000 N/A N/A N/A N/A AFTER RTE 16 3A107380
* ACC NOT EQUAL 0000-INDICATING Q REG FAILED 3A107390
* 3A107400
* 3A107410
3093 0 0480 OC A440 SLT 32 3A107420
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A107430
* 0000 0000 N/A N/A N/A N/A AFTER SLT 32 3A107440
* ACCUM NOT EQUAL 0000 3A107450
* 3A107460
* 3A107470
* 3A107480
* 3A107490
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PRG ID 03A1-1
PAGE 6

```
*****3A107500
ADDRESS * 3A107510
OF * 3A107520
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A107530
*****3A107540
3094 0 048D OC A440 SLT 32 3A107550
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A107560
* 0000 0000 N/A N/A N/A C AFTER SLT 32 3A107570
* CARRY NOT SET 3A107580
* 3A107590
* 3A107600
3095 0 0480 OC A440 SLT 32 & RTE 16 3A107610
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A107620
* 0000 0000 N/A N/A N/A N/A AFTER SLT 32 3A107630
* 0000 0000 N/A N/A N/A N/A AFTER RTE 16 3A107640
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A107650
* 3A107660
* 3A107670
3096 0 04DA OC A444 SLT 16 3A107680
* 0000 FFFF N/A N/A N/A N/A AFTER LO 3A107690
* FFFF 0000 N/A N/A N/A N/A AFTER SLT 16 3A107700
* ACCUM NOT EQUAL FFFF 3A107710
* 3A107720
* 3A107730
3097 0 040A OC A444 SLT 16 3A107740
* 0000 FFFF N/A N/A N/A N/A AFTER LO 3A107750
* FFFF 0000 N/A N/A N/A N/A OFF AFTER SLT 16 3A107760
* CARRY ON SHOULD NOT BE 3A107770
* 3A107780
* 3A107790
3098 0 04DA OC A444 SLT 16 & RTE 16 3A107800
* 0000 FFFF N/A N/A N/A N/A AFTER LO 3A107810
* FFFF 0000 N/A N/A N/A N/A AFTER SLT 16 3A107820
* 0000 FFFF N/A N/A N/A N/A AFTER RTE 16 3A107830
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A107840
* 3A107850
* 3A107860
3099 0 04F9 OC A44A SLT 15 3A107870
* 0000 5555 N/A N/A N/A N/A AFTER LO 3A107880
* 2AAA 8000 N/A N/A N/A N/A AFTER SLT 15 3A107890
* ACCUM NOT EQUAL 2AAA 3A107900
* 3A107910
* 3A107920
309A 0 04F9 OC A44A SLT 15 3A107930
* 0000 5555 N/A N/A N/A N/A AFTER LO 3A107940
* 2AAA 8000 N/A N/A N/A N/A OFF AFTER SLT 15 3A107950
* CARRY SET-SHOULD NOT BE 3A107960
* 3A107970
* 3A107980
309B 0 04F9 OC A44A SLT 15 & RTE 16 3A107990
* 0000 5555 N/A N/A N/A N/A AFTER LO 3A108000
* 2AAA 8000 N/A N/A N/A N/A AFTER SLT 15 3A108010
* 8000 2AAA N/A N/A N/A N/A AFTER RTE 16 3A108020
* ACCUM NOT EQUAL 8000-INDICATING Q REG FAILED 3A108030
* 3A108040
* 3A108050
309C 0 0519 OC 8440 SERIES OF SLTS-32 3A108060
* *TOTAL SHIFTS 3A108070
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A108080
* 0000 0000 N/A N/A N/A N/A AFTER SLT2S 3A108090
* ACCUM NOT EQUAL 0000 3A108100
* 3A108110
* 3A108120
309D 0 0519 OC 8440 SERIES OF SLTS-32 3A108130
* *TOTAL SHIFTS 3A108140
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A108150
* 0000 0000 N/A N/A N/A N/A C AFTER SLT2S 3A108160
* CARRY NOT ON 3A108170
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PRG ID 03A1-1
PAGE 6A

```
*****3A108180
ADDRESS * 3A108190
OF * 3A108200
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A108210
*****3A108220
309E 0 0519 OC 8440 SERIES OF SLTS-32 3A108230
* 3A108240
* 3A108250
* 0000 0001 N/A N/A N/A N/A AFTER LO 3A108260
* 0000 0000 N/A N/A N/A N/A AFTER SLTS 3A108270
* 0000 0000 N/A N/A N/A N/A AFTER RTE 16 3A108280
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A108290
* 3A108300
* 3A108310
309F 0 0542 OC A480 STO 3A108320
* 3A108330
* 0000 N/A N/A N/A N/A N/A 3A108340
* STORING 0000 INTO A STORAGE LOCATION 3A108350
* CONTAINING FFFF QIO NOT RETURN 0000 WHEN 3A108360
* RELOADED IN THE ACCUM 3A108370
* 3A108380
30A0 0 054E OC A482 STO 3A108390
* 3A108400
* FFFF N/A N/A N/A N/A N/A 3A108410
* STORING FFFF INTO A STORAGE LOCATION 3A108420
* CONTAINING 0000 QIO NOT RETURN FFFF WHEN 3A108430
* RELOADED IN THE ACCUM 3A108440
* 3A108450
30A1 0 055F OC A4C0 STS 3A108460
* N/A N/A N/A N/A N/A ON AFTER LOS 3 3A108470
* N/A N/A N/A N/A N/A OFF AFTER LOS 0 3A108480
* N/A N/A N/A N/A N/A OFF AFTER STS 3A108490
* LOS 0 FAILED TO RESET CARRY AND OVERFLOW OR 3A108500
* STS FAILED TO STORE INDICATORS. 3A108510
* 3A108520
* 3A108530
30A2 0 056E OC A4C2 STS 3A108540
* N/A N/A N/A N/A N/A C&O AFTER LOS 3A108550
* N/A N/A N/A N/A N/A OFF AFTER STS 3A108560
* STS QIO NOT CLEAR CARRY 3A108570
* 3A108580
* 3A108590
30A3 0 0568 OC A4C2 STS CK ACC 3A108600
* 3A108610
* INITIALLY ACC HAS CORE LOCATION OF 3A108620
* SYMBOLIC LABEL A4C2 3A108630
* ACC DESTROYED AFTER STS 3A108640
* 3A108650
30A4 0 0568 OC A4C2 STS 3A108660
* N/A N/A N/A N/A N/A C&O AFTER LOS 3A108670
* N/A N/A N/A N/A N/A OFF AFTER STS 3A108680
* STS QIO NOT CLEAR OVERFLOW 3A108690
* 3A108700
* 3A108710
30A5 0 0568 OC A4C2 STS 3A108720
* N/A N/A N/A N/A N/A BEFORE LO 3A108730
* 0003 AFTER LO 3A108740
* STS OF 0003 INTO A STORAGE LOCATION 3A108750
* CONTAINING 0000 QIO NOT RETURN 0003 WHEN 3A108760
* RELOADED IN THE ACCUM 3A108770
* 3A108780
30A6 0 0590 OC A4C8 STS 3A108790
* N/A N/A N/A N/A N/A C&O AFTER LOS 3 3A108800
* N/A N/A N/A N/A N/A C AFTER LOS 2 3A108810
* N/A N/A N/A N/A N/A OFF AFTER STS 3A108820
* 0002 N/A N/A N/A N/A OFF AFTER LO 3A108830
* STS FAILED TO STORE OR LOS 2 FAILED TO RESET 3A108840
* OVERFLOW. 3A108850
```

```
*****3A108860
ADDRESS * 3A108870
OF * 3A108880
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A108890
*****3A108900
30A7 0 0590 OC A4C8 STS 3A108910
* N/A N/A N/A N/A N/A C&O AFTER LOS 3 3A108920
* N/A N/A N/A N/A N/A C AFTER LOS 3A108930
* N/A N/A N/A N/A N/A OFF AFTER STS 3A108940
* STS QIO NOT CLEAR CARRY OR OVERFLOW IF OVERFLOW 3A108950
* HAO NOT BEEN RESET BY LOS 2 3A108960
* 3A108970
30A8 0 05A7 OC A4CC STS 3A108980
* N/A N/A N/A N/A N/A C&O AFTER LOS 3 3A108990
* N/A N/A N/A N/A N/A O AFTER LOS 1 3A109000
* N/A N/A N/A N/A N/A OFF AFTER STS 3A109010
* LOS 1 FAILED, IF ACCUMULATOR IS OTHER THAN /0001 3A109020
* 3A109030
* 3A109040
30A9 0 05A7 OC A4CC STS 3A109050
* N/A N/A N/A N/A N/A C&O AFTER LOS 3 3A109060
* N/A N/A N/A N/A N/A O AFTER LOS 1 3A109070
* N/A N/A N/A N/A N/A OFF AFTER STS 3A109080
* STS FAILED TO RESET INDICATORS. 3A109090
* 3A109100
* 3A109110
* 3A109120
30AA 0 05C4 OC A500 BSC,Q&EZC 3A109130
* 8001 N/A N/A N/A N/A C&O 3A109140
* BSC SKIPPED-SHOULD NOT HAVE 3A109150
* 3A109160
* 3A109170
30AB 0 05CF OC A502 BSC,Q&CC 3A109180
* 0000 N/A N/A N/A N/A C&O 3A109190
* BSC SKIPPED-SHOULD NOT HAVE 3A109200
* 3A109210
* 3A109220
30AC 0 050A OC A504 BSC,Q&E 3A109230
* 8000 N/A N/A N/A N/A C&O 3A109240
* BSC FAILED TO SKIP 3A109250
* 3A109260
* 3A109270
30AD 0 050A OC A504 BSC,Q 3A109280
* 8000 N/A N/A N/A N/A C 3A109290
* BSC FAILED TO CLEAR OVERFLOW 3A109300
* 3A109310
30AE 0 05F1 DC A508 BSC,Q&EZ 3A109320
* 0001 N/A N/A N/A N/A OFF 3A109330
* BSC FAILED TO SKIP 3A109340
* 3A109350
* 3A109360
30AF 0 05FC OC A50A BSC,Q&OCE LONG FORM 3A109370
* 8001 N/A N/A N/A N/A C&O 3A109380
* BSC QIO NOT BRANCH - SHOULD HAVE 3A109390
* 3A109400
* 3A109410
30B0 0 05FC OC A50A BSC,Q&OCE LONG FORM 3A109420
* 8001 N/A N/A N/A N/A C&O 3A109430
* BSC SKIPPED-SHOULD BRANCH 3A109440
* 3A109450
* 3A109460
30B1 0 0619 OC A50C BSC,Q&Z LONG FORM 3A109470
* 0004 N/A N/A N/A N/A C&O 3A109480
* BSC QIO NOT BRANCH - SHOULD HAVE 3A109490
* 3A109500
* 3A109510
30B2 0 0619 OC A50C BSC,Q&Z LONG FORM 3A109520
* 0004 N/A N/A N/A N/A C&O 3A109530
```

```
* BSC SKIPPED-SHOULD BRANCH
*****
ADDRESS *
DF *
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
3083 0 062D      DC      A50E      BSC,&EOCZ LONG
*
* B001 N/A      N/A      N/A      N/A      C&D
* BSC BRANCHED-SHOULD NOT
*
3084 0 062D      OC      A50E      BSC,&EOCZ LONG
*
* B001 N/A      N/A      N/A      N/A      C&D
* BSC SKIPPED-SHOULD NOT
*
3085 0 0641      OC      B500      BSC,&
* 0001 N/A      N/A      N/A      N/A      C&D
* BSC ON PLUS CLEARED THE OVERFLOW F-F
*
3086 0 0641      OC      B500      BSC,&
* 0001 N/A      N/A      N/A      N/A      N/A
* BSC FAILED TO SKIP
*
3087 0 0660      OC      A540      BSI,ECO&Z LONG
*
* B001 N/A      N/A      N/A      N/A      C&D
* BSI DID NOT BRANCH - SHOULD HAVE
*
3088 0 0560      OC      A540      BSI,ECO&Z LONG
*
* B001 N/A      N/A      N/A      N/A      C&D
* BSI SKIPPED-SHOULD BRANCH
*
3089 0 0660      DC      A540      BSI,ECO&Z LONG
*
* B001 N/A      N/A      N/A      N/A      C&D AFTER LDS
* B001 N/A      N/A      N/A      N/A      C AFTER BSI
* BSI DID NOT CLEAR OVERFLOW
*
308A 0 0681      OC      A544      BSI,Z- LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI DID NOT BRANCH - SHOULD HAVE
*
308B 0 0681      DC      A544      BSI,Z- LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI SKIPPED-SHOULD BRANCH
*
308C 0 0696      DC      A546      BSI,Z LONG FORM
* 0000 N/A      N/A      N/A      N/A      N/A
* BSI BRANCHED-SHOULD NOT
*
308D 0 0696      OC      A546      BSI,Z LONG FORM
* 0000 N/A      N/A      N/A      N/A      N/A
* BSI SKIPPED-SHOULD NOT U
*
```

```
*
*****
ADDRESS *
DF *
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
308E 0 06A9      DC      A548      BSI,- LONG FORM
* 8001 N/A      N/A      N/A      N/A      N/A
* BSI SKIPPED-SHOULD NOT
*
308F 0 06A9      DC      A548      BSI,- LONG FORM
* 8001 N/A      N/A      N/A      N/A      N/A
* BSI BRANCHED-SHOULD NOT
*
30C0 0 068B      OC      A54A      BSI,& LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI SKIPPED-SHOULD NOT
*
30C1 0 068B      DC      A54A      BSI,& LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI BRANCHED-SHOULD NOT
*
30C2 0 06CD      DC      A54C      BSI,E LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI SKIPPED-SHOULD NOT
*
30C3 0 06C0      DC      A54C      BSI,E LONG FORM
* 0002 N/A      N/A      N/A      N/A      N/A
* BSI BRANCHED-SHOULD NOT
*
30C4 0 06DF      OC      A54E      BSI,C LONG FORM
* N/A      N/A      N/A      N/A      N/A C
* BSI SKIPPED-SHOULD NOT
*
30C5 0 06DF      DC      A54E      BSI,C LONG FORM
* N/A      N/A      N/A      N/A      N/A C
* BSI BRANCHED SHOULD NOT
*
30C6 0 06F1      DC      A54F      BSI,O LONG FORM
* N/A      N/A      N/A      N/A      N/A O
* BSI SKIPPED-SHOULD NOT
*
30C7 0 06F1      OC      A54F      BSI,O LONG FORM
* N/A      N/A      N/A      N/A      N/A O
* BSI BRANCHED-SHOULD NOT
*
30CB 0 0704      DC      A580      LDD
* 0000 0000 N/A      N/A      N/A      N/A
* ACCUM NOT EQUAL 0000
*
30C9 0 0704      DC      A580      LDD & RTE 16
* 0000 0000 N/A      N/A      N/A      N/A AFTER LDD
* 0000 0000 N/A      N/A      N/A      N/A AFTER RTE 16
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED
*
30CA 0 0717      DC      A584      LDD
* FFFF FFFF N/A      N/A      N/A      N/A
```

```
***** * ACCUM NOT EQUAL FFFF 3A110900
*****
ADDRESS * 3A110910
OF * 3A110920
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A110930
***** 3A110940
30CB 0 0717 * OC A584 LOO & RTE 16 3A110950
* FFFF FFFF N/A N/A N/A N/A AFTER LOO 3A110960
* FFFF FFFF N/A N/A N/A N/A AFTER RTE 16 3A110970
* ACCUM NOT EQUAL FFFF-INDICATING Q REG FAILED 3A110980
* 3A110990
* 3A111000
* 3A111010
30CC 0 0728 * OC A588 LOO 000 ADDRESS 3A111020
* 0000 0000 N/A N/A N/A N/A 3A111030
* ACCUM NOT EQUAL 0000 3A111040
* 3A111050
* 3A111060
30CD 0 0728 * OC A588 LOD-000 ADDRESS 3A111070
* * & RTE 16 3A111080
* 0000 0000 N/A N/A N/A N/A AFTER LOO 3A111090
* 0000 0000 N/A N/A N/A N/A AFTER RTE 16 3A111100
* ACCUM NOT EQUAL 0000-INDICATING Q REG FAILED 3A111110
* 3A111120
* 3A111130
30CE 0 0730 * OC A5C0 STO 3A111140
* 0000 0000 N/A N/A N/A N/A 3A111150
* USING STD-ACCUM NOT STORED IN LOCATION EA 3A111160
* 3A111170
* 3A111180
30CF 0 0730 * OC A5C0 STO 3A111190
* 0000 0000 N/A N/A N/A N/A 3A111200
* USING STO-Q REG NOT STORED IN LOCATION EA&1 3A111210
* 3A111220
* 3A111230
3000 0 0751 * OC A5C4 STO 3A111240
* FFFF FFFF N/A N/A N/A N/A 3A111250
* USING STD-ACCUM NOT STORED IN LOCATION EA 3A111260
* 3A111270
* 3A111280
3001 0 0751 * OC A5C4 STO 3A111290
* FFFF FFFF N/A N/A N/A N/A 3A111300
* USING STO-Q REG NOT STORED IN LOCATION EA&1 3A111310
* 3A111320
* 3A111330
3002 0 076A * OC A5C8 STO 000 ADDRESS 3A111340
* 0000 0000 N/A N/A N/A N/A 3A111350
* STO USING 000 ADDRESS-ACCUM NOT STORED IN EA 3A111360
* 3A111370
* 3A111380
3003 0 076A * OC A5C8 STO-000 ADDRESS 3A111390
* 0000 0000 N/A N/A N/A N/A 3A111400
* STO USING 000 ADDRESS-ACCUM NOT STORED 3A111410
* IN EA&1 3A111420
* 3A111430
* 3A111440
3004 0 078F * OC A600 LOX 1 3A111450
* N/A N/A N/A N/A N/A N/A 3A111460
* TAG REG 8IT 7 WILL NOT SET 3A111470
* 3A111480
* 3A111490
3005 0 0798 * OC A602 LOX 2 3A111500
* N/A N/A N/A N/A N/A N/A 3A111510
* TAG REG 8IT 6 WILL NOT SET 3A111520
* 3A111530
* 3A111540
3006 0 07A1 * OC A604 LOX 1 3A111550
* N/A N/A 0000 N/A N/A N/A 3A111560
* INDEX REG 1 NOT EQUAL 0000 3A111570
```

```
***** * 3A111580
*****
ADDRESS * 3A111590
OF * 3A111600
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A111610
***** 3A111620
3007 0 07A0 * DC A606 LOX 2 3A111630
* N/A N/A N/A 0000 N/A N/A 3A111640
* INDEX REG 2 NOT EQUAL 0000 3A111650
* 3A111660
* 3A111670
* 3A111680
3008 0 07BA * DC A608 LOX 3 3A111690
* N/A N/A N/A N/A 0000 N/A 3A111700
* INDEX REG 3 NOT EQUAL 0000 3A111710
* 3A111720
* 3A111730
3009 0 07C7 * OC A60A LOX 1 3A111740
* N/A N/A FFFF N/A N/A N/A 3A111750
* INDEX REG 1 NOT EQUAL FFFF 3A111760
* 3A111770
* 3A111780
300A 0 07D4 * OC A60C LOX 2 3A111790
* N/A N/A N/A FFFF N/A N/A 3A111800
* INDEX REG 2 NOT EQUAL FFFF 3A111810
* 3A111820
* 3A111830
300B 0 07E1 * OC A60E LOX 3 3A111840
* N/A N/A N/A N/A FFFF N/A 3A111850
* INDEX REG 3 NOT EQUAL FFFF 3A111860
* 3A111870
* 3A111880
300C 0 07EE * OC 8600 LOX 1 LONG FORM 3A111890
* N/A N/A 0001 N/A N/A N/A 3A111900
* INDEX REG 1 NOT EQUAL 0001 3A111910
* 3A111920
* 3A111930
300D 0 07FC * OC B602 LOX 3 INDIRECT 3A111940
* N/A N/A N/A N/A FFFF N/A 3A111950
* INDEX REG 3 NOT EQUAL FFFF 3A111960
* 3A111970
* 3A111980
300E 0 0810 * OC A640 STX 3A111990
* N/A N/A N/A N/A N/A N/A 3A112000
* STX WITH NO TAG 010 NOT STORE 1-CTR CORRECT 3A112010
* 3A112020
* 3A112030
300F 0 0827 * OC A642 STX 1 3A112040
* N/A N/A 0000 N/A N/A N/A 3A112050
* INDEX REG 1 WAS NOT STORED BY STX 3A112060
* 3A112070
* 3A112080
30E0 0 0834 * OC A644 STX 2 3A112090
* N/A N/A N/A 0000 N/A N/A 3A112100
* INDEX REG 2 NOT STORED BY STX 3A112110
* 3A112120
* 3A112130
30E1 0 0841 * OC A646 STX 3 3A112140
* N/A N/A N/A N/A 0000 N/A 3A112150
* INDEX REG 3 NOT STORED BY STX 3A112160
* 3A112170
* 3A112180
30E2 0 084E * OC A648 STX 1 3A112190
* N/A N/A FFFF N/A N/A N/A 3A112200
* INDEX REG 1 NOT STORED BY STX 3A112210
* 3A112220
* 3A112230
30E3 0 085C * OC A64A STX 2 3A112240
* N/A N/A N/A FFFF N/A N/A 3A112250
```

```
*****
* INDEX REG 2 NOT STORED BY STX
*****
ADDRESS *
OF *
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
30E4 0 086A * DC A64C STX 3
* N/A N/A N/A N/A FFFF N/A
* INDEX REG 3 NOT STORED BY STX
*
30E5 0 08DC * OC A680 ADD
* FFFF N/A N/A N/A N/A C AFTER LO&LOS
* FFFF N/A N/A N/A N/A C AFTER A
* ADD FFFF & 0000 TURNED ON OVERFLOW
*
30E6 0 08DC * DC A680 AOD
* FFFF N/A N/A N/A N/A N/A AFTER LO
* FFFF N/A N/A N/A N/A N/A AFTER A
* AOD FFFF & 0000 FAILED TO EQUAL FFFF
*
30E7 0 08F1 * OC A684 AOD
* FFFF N/A N/A N/A N/A OFF AFTER LD&LOS
* 0000 N/A N/A N/A N/A C AFTER A
* AOD FFFF & 0001 DID NOT TURN ON CARRY
*
30E8 0 08F1 * DC A684 AOD
* FFFF N/A N/A N/A N/A N/A AFTER LD&LOS
* 0000 N/A N/A N/A N/A N/A AFTER A
* AOD FFFF & 0001 DID NOT EQUAL 0000
*
30E9 0 0904 * DC A688 AOD
* FFFF N/A N/A N/A N/A OFF AFTER LO&LOS
* FFFF N/A N/A N/A N/A C AFTER A
* ADD FFFF & FFFF DID NOT TURN ON CARRY
*
30EA 0 0904 * DC A688 AOD
* FFFF N/A N/A N/A N/A N/A AFTER LO&LOS
* FFFF N/A N/A N/A N/A N/A AFTER A
* AOD FFFF & FFFF DID NOT EQUAL FFFE
*
30EB 0 0918 * OC A68C AOD
* 4000 N/A N/A N/A N/A OFF AFTER LO
* 8000 N/A N/A N/A N/A O AFTER A
* ADD 4000 & 4000 DID NOT TURN ON OVERFLOW
*
30EC 0 0918 * OC A68C AOD
* 4000 N/A N/A N/A N/A N/A
* AOD 4000 & 4000 DID NOT EQUAL 8000
*
30ED 0 092C * OC B680 ADD
* 8000 N/A N/A N/A N/A N/A AFTER LD
* 0000 N/A N/A N/A N/A N/A AFTER A
* ADD 8000 & 8000 NOT EQUAL 0000
*
30EE 0 092C * DC B680 AOD
* 8000 N/A N/A N/A N/A OFF AFTER LD
* 0000 N/A N/A N/A N/A C&O AFTER A
```

```
*****
* ADD 8000 & 8000 DID NOT TURN ON OVERFLOW
*****
ADDRESS *
OF *
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
30EF 0 092C * DC B680 AOD
* 8000 N/A N/A N/A N/A OFF AFTER LD
* 0000 N/A N/A N/A N/A C&O AFTER A
* ADD 8000 & 8000 DID NOT TURN ON CARRY
*
30F0 0 0954 * DC A6C0 LDX 1
* N/A N/A FFF4 N/A N/A N/A
* INDEX REG 1 WAS NOT LOADED EQUAL FFF4
*
30F1 0 0954 * OC A6C0 LO 1
* N/A N/A FFF4 N/A N/A N/A
* A LOAD INSTR INDEXED BY INDEX REG 1
* LOADED THE WRONG LOCATION
*
30F2 0 096C * DC A6C2 LOX 2
* N/A N/A N/A 0004 N/A N/A
* INDEX REG 2 NOT LOADED EQUAL 0004
*
30F3 0 096C * DC A6C2 LD 2
* N/A N/A N/A 0004 N/A N/A
* A LOAD INSTR INDEXED BY INDEX REG 2
* LOADED THE WRONG LOCATION
*
30F4 0 0984 * DC A6C4 LDX 3
* N/A N/A N/A N/A 0000 N/A
* INDEX REG 3 NOT LOADED EQUAL 0000
*
30F5 0 0984 * OC A6C4 LO 3
* N/A N/A N/A N/A 0000 N/A
* A LOAD INSTR INDEXED BY INDEX REG 3
* LOADED THE WRONG LOCATION
*
30F6 0 0998 * DC A6C6 LDX 3
* N/A N/A N/A N/A 0001 N/A
* INDEX REG 3 NOT EQUAL 0001
*
30F7 0 0998 * OC A6C6 LO 3 LONG FORM
* N/A N/A N/A N/A 0001 N/A
* A LONG FORM LOAD INDEXED BY INDEX REG 3
* LOADED THE WRONG LOCATION
*
30F8 0 09B3 * DC A6C8 LOX 3
* N/A N/A N/A N/A FFFF N/A
* INDEX REG 3 NOT EQUAL FFFF
*
30F9 0 09B3 * DC A6C8 LD 3 INDIRECT
* N/A N/A N/A N/A FFFF N/A
* AN INDIRECT LOAD INDEXED BY INDEX REG 3
* LOADED THE WRONG LOCATION
*
```

```
*****
ADDRESS *
OF *
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
3DFA 0 0A38 DC A700 SUB
* 0000 N/A N/A N/A N/A N/A AFTER LD
* FFFF N/A N/A N/A N/A N/A AFTER S
* SUB 0001 FORM 0000 010 NDT EQUAL FFFF
*
30FB 0 0A38 DC A700 SUB
* 0000 N/A N/A N/A N/A OFF AFTER LD
* FFFF N/A N/A N/A N/A C AFTER S
* SUB 0001 FROM 0000 010 NOT SET CARRY
*
3DFC D 0A4F DC A704 SUB
* 0000 N/A N/A N/A N/A N/A AFTER LD
* 0001 N/A N/A N/A N/A N/A AFTER S
* SUB FFFF FROM 0000 010 NOT EQUAL 0001
*
3DFD 0 0A4F DC A704 SUB
* 0000 N/A N/A N/A N/A OFF AFTER LD
* 0001 N/A N/A N/A N/A C AFTER S
* SUB FFFF FROM 0000 010 NOT SET CARRY
*
30FE D 0A66 DC A708 SUB
* 8000 N/A N/A N/A N/A N/A AFTER LD
* 7FFF N/A N/A N/A N/A N/A AFTER S
* SUB 0001 FROM 8000 010 NOT EQUAL 7FFF
*
3DFF 0 0A66 DC A708 SUB
* 8000 N/A N/A N/A N/A OFF AFTER LD
* 0001 N/A N/A N/A N/A D AFTER CARRY
* AND OVERFLOW CONDITION HAD BEEN LOADED INTO
* ACCUMULATOR AS A NUMBER
* SUB 0001 FROM 8000 010 NOT TURN ON OVERFLOW
*
31DD D 0A7D DC A70C SUB
* 0000 N/A N/A N/A N/A N/A AFTER LD
* 8000 N/A N/A N/A N/A N/A AFTER S
* SUB 8000 FROM 0000 010 NOT EQUAL 8000
*
31D1 D 0A7D DC A70C SUB
* 0000 N/A N/A N/A N/A OFF AFTER LD
* 8000 N/A N/A N/A N/A C&D AFTER S
* SUB 8000 FROM 0000 010 NOT TURN ON OVERFLOW
*
31D2 D 0A7D DC A70C SUB
* 0000 N/A N/A N/A N/A OFF AFTER LD
* 8000 N/A N/A N/A N/A C&D AFTER S
* SUB 8000 FROM 0000 010 NOT TURN ON CARRY
*
3103 D 0AA8 DC A74D AD-0000 0000
* FFFF FFFF N/A N/A N/A N/A AFTER LDD
* FFFF FFFF N/A N/A N/A N/A AFTER AD
* ACCUM NOT EQUAL FFFF
*
```

```
*****
ADDRESS *
DF *
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
3104 D 0AA8 DC A74D AD-0000 0000
* FFFF FFFF N/A N/A N/A N/A AFTER ADD
* FFFF FFFF N/A N/A N/A N/A AFTER RTE
* Q REG NDT EQUAL FFFF
*
3105 0 0AA8 DC A74D AD-DDDD 0000
* FFFF FFFF N/A N/A N/A OFF AFTER LDD
* FFFF FFFF N/A N/A N/A OFF AFTER RTE
* OVERFLOW SET SHOULD NOT BE
*
3106 0 0AA8 DC A74D AD-DDDD 0000
* FFFF FFFF N/A N/A N/A OFF AFTER LDD
* FFFF FFFF N/A N/A N/A OFF AFTER RTE
* CARRY SET-SHOULD NOT BE
*
3107 0 0AD7 DC A746 AD-FFFF FFFF
* 0000 0001 N/A N/A N/A N/A AFTER LDD
* 0000 0000 N/A N/A N/A N/A AFTER AD
* OVERFLOW SET- SHOULD NOT BE
*
3108 0 0AD7 DC A746 AD-FFFF FFFF
* 0000 0001 N/A N/A N/A N/A AFTER LDD
* 0000 0000 N/A N/A N/A N/A AFTER AD
* Q REG NOT EQUAL 0000
*
3109 0 0AD7 DC A746 AD-FFFF FFFF
* 0000 0001 N/A N/A N/A OFF AFTER LDD
* 0000 0000 N/A N/A N/A C AFTER AD
* CARRY NOT SET- SHOULD BE
*
31DA 0 0AD7 DC A746 AD-FFFF FFFF
* 0000 0001 N/A N/A N/A OFF AFTER LDD
* 0000 0000 N/A N/A N/A C AFTER AD
* CARRY NDT SET-SHOULD BE
*
31DB 0 0BD3 DC A74C AD-FFFF FFFF
* FFFF FFFF N/A N/A N/A N/A AFTER LDD
* FFFF FFFF N/A N/A N/A N/A AFTER AD
* ACCUM NOT EQUAL FFFF
*
310C 0 0BD3 DC A74C AD-FFFF FFFF
* FFFF FFFF N/A N/A N/A N/A AFTER LDD
* FFFF FFFF N/A N/A N/A N/A AFTER AD
* Q REG NOT EQUAL FFFE
*
31DD D 0BD3 DC A74C AD-FFFF FFFF
* FFFF FFFF N/A N/A N/A OFF AFTER LDD
* FFFF FFFF N/A N/A N/A C AFTER AD
* OVERFLOW ON-SHOULD NOT BE
*
```



```
*****
ADDRESS *
OF *
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
310E 0 0803 DC A74C AO-FFFF FFFF 3A114980
* FFFF FFFF N/A N/A N/A OFF AFTER LDD 3A114990
* FFFF FFFF N/A N/A N/A C AFTER AO 3A115000
* CARRY NOT ON-SHOULD BE 3A115010
* 3A115020
* 3A115030
310F 0 0820 DC 8742 AD-FFFF FFFF 3A115040
* FFFF 7FFF N/A N/A N/A OFF AFTER LDD 3A115050
* FFFF 7FFF N/A N/A N/A N/A AFTER AO 3A115060
* ACCUM NOT EQUAL FFFF 3A115070
* 3A115080
* 3A115090
3110 0 0820 DC 8742 AD-FFFF FFFF 3A115100
* FFFF 7FFF N/A N/A N/A OFF AFTER LDD 3A115110
* FFFF 7FFF N/A N/A N/A N/A AFTER AO 3A115120
* Q REG NOT EQUAL 7FFF 3A115130
* 3A115140
* 3A115150
3111 0 0820 DC 8742 AO-FFFF FFFF 3A115160
* FFFF 7FFF N/A N/A N/A OFF AFTER LDD 3A115170
* FFFF 7FFF N/A N/A N/A N/A AFTER AO 3A115180
* OVERFLOW SET-SHOULD NOT BE 3A115190
* 3A115200
* 3A115210
3112 0 0820 OC 8742 AD-FFFF FFFF 3A115220
* FFFF 7FFF N/A N/A N/A OFF AFTER LDD 3A115230
* FFFF 7FFF N/A N/A N/A C AFTER AO 3A115240
* CARRY NOT SET-SHOULD BE 3A115250
* 3A115260
* 3A115270
3113 0 0857 DC 8747 AO-0001 000 LDC 3A115280
* 0000 0001 N/A N/A N/A N/A AFTER LDD 3A115290
* 0001 0002 N/A N/A N/A N/A AFTER AO 3A115300
* ACCUM NOT EQUAL 0001 3A115310
* 3A115320
* 3A115330
3114 0 0857 OC 8747 AO-0001 000 LDC 3A115340
* 0000 0001 N/A N/A N/A N/A AFTER LDD 3A115350
* 0001 0002 N/A N/A N/A N/A AFTER AO 3A115360
* Q REG NOT EQUAL 0002 3A115370
* 3A115380
* 3A115390
3115 0 0879 DC A780 SD-0000 0001 3A115400
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115410
* FFFF FFFF N/A N/A N/A N/A AFTER SD 3A115420
* ACCUM NOT EQUAL FFFF 3A115430
* 3A115440
* 3A115450
3116 0 0879 OC A780 SO-0000 0001 3A115460
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115470
* FFFF FFFF N/A N/A N/A N/A AFTER SD 3A115480
* Q REG NOT EQUAL FFFF 3A115490
* 3A115500
* 3A115510
3117 0 0879 OC A780 SD-0000 0001 3A115520
* 0000 0000 N/A N/A N/A OFF AFTER LDD 3A115530
* FFFF FFFF N/A N/A N/A C AFTER SD 3A115540
* OVERFLOW ON-SHOULD NOT BE 3A115550
* 3A115560
* 3A115570
* 3A115580
* 3A115590
* 3A115600
* 3A115610
* 3A115620
* 3A115630
* 3A115640
* 3A115650
```

```
*****
ADDRESS *
OF *
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
3118 0 0879 OC A780 SD-0000 0001 3A115660
* 0000 0000 N/A N/A N/A OFF AFTER LDD 3A115670
* FFFF FFFF N/A N/A N/A C AFTER SD 3A115680
* CARRY NOT ON-SHOULD BE 3A115690
* 3A115700
* 3A115710
3119 0 08A3 OC A786 SO-FFFF FFFF 3A115720
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115730
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A115740
* ACCUM NOT EQUAL TO 0000 3A115750
* 3A115760
* 3A115770
311A 0 08A3 DC A786 SO-FFFF FFFF 3A115780
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115790
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A115800
* Q REG NOT EQUAL 0001 3A115810
* 3A115820
* 3A115830
311B 0 0888 DC A78A SO-FFFF FFFF 3A115840
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115850
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A115860
* Q REG NOT EQUAL 0001 3A115870
* 3A115880
* 3A115890
311C 0 0888 OC A78A SD-FFFF FFFF 3A115900
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115910
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A115920
* Q REG NOT EQUAL 0001 3A115930
* 3A115940
* 3A115950
311D 0 08CC DC A78E SO-FFFF 000 LDC 3A115960
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A115970
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A115980
* ACCUM NOT EQUAL 0000 3A115990
* 3A116000
* 3A116010
311E 0 08CC OC A78E SO-FFFF 000 LDC 3A116020
* 0000 0000 N/A N/A N/A N/A AFTER LDD 3A116030
* 0000 0001 N/A N/A N/A N/A AFTER SD 3A116040
* Q REG NOT EQUAL 0001 3A116050
* 3A116060
* 3A116070
311F 0 08EC OC A7C0 MULT-2AAA 3A116080
* 5555 N/A N/A N/A N/A N/A AFTER LO 3A116090
* 0E38 9C72 N/A N/A N/A N/A AFTER M 3A116100
* ACCUM NOT EQUAL 0E38 3A116110
* 3A116120
* 3A116130
3120 0 08EC DC A7C0 MULT-2AAA 3A116140
* 5555 N/A N/A N/A N/A N/A AFTER LO 3A116150
* 0E38 9C72 N/A N/A N/A N/A AFTER M 3A116160
* Q REG NOT EQUAL 9C72 3A116170
* 3A116180
* 3A116190
3121 0 0C01 DC A7C4 MULT-FFFF 3A116200
* FFFF N/A N/A N/A N/A N/A AFTER LD 3A116210
* 0000 0001 N/A N/A N/A N/A AFTER M 3A116220
* ACCUM NOT EQUAL 0000 3A116230
* 3A116240
* 3A116250
* 3A116260
* 3A116270
* 3A116280
* 3A116290
* 3A116300
* 3A116310
* 3A116320
* 3A116330
```

*****						3A116340
*****						3A116350
ADDRESS						3A116360
OF						3A116370
B-REG ROUTINE						3A116380
*****						3A116390
*****						3A116400
3122 0 0C01	DC	A7C4	MULT-FFFF			3A116410
	* FFFF	N/A	N/A	N/A	N/A AFTER LO	3A116420
	* 0000	0001	N/A	N/A	N/A AFTER M	3A116430
	* Q REG	NOT EQUAL	0001			3A116440
						3A116450
*****						3A116460
3123 0 0C15	DC	A7C8	MULT-FFFF			3A116470
	* 0000	N/A	N/A	N/A	N/A AFTER LO	3A116480
	* 0000	0000	N/A	N/A	N/A AFTER M	3A116490
	* ACCUM	NOT EQUAL	0000			3A116500
						3A116510
*****						3A116520
3124 0 0C15	DC	A7C8	MULT-FFFF			3A116530
	* 0000	N/A	N/A	N/A	N/A AFTER LD	3A116540
	* 0000	0000	N/A	N/A	N/A AFTER M	3A116550
	* Q REG	NOT EQUAL	0000			3A116560
						3A116570
*****						3A116580
3125 0 0C28	DC	A7CC	MULT-0000			3A116590
	* FFFF	N/A	N/A	N/A	N/A AFTER LO	3A116600
	* 0000	0000	N/A	N/A	N/A AFTER M	3A116610
	* ACCUM	NOT EQUAL	0000			3A116620
						3A116630
*****						3A116640
3126 0 0C28	DC	A7CC	MULT-0000			3A116650
	* FFFF	N/A	N/A	N/A	N/A AFTER LD	3A116660
	* 0000	0000	N/A	N/A	N/A AFTER M	3A116670
	* Q REG	NOT EQUAL	0000			3A116680
						3A116690
*****						3A116700
3127 0 0C43	DC	A800	OVD-8000			3A116710
	* 4000	7FFF	N/A	N/A	N/A AFTER LOO	3A116720
	* 8000	7FFF	N/A	N/A	N/A AFTER O	3A116730
	* ACCUM	NOT EQUAL	8000			3A116740
						3A116750
*****						3A116760
3128 0 0C43	DC	A800	OVD-8000			3A116770
	* 4000	7FFF	N/A	N/A	N/A AFTER LOO	3A116780
	* 8000	7FFF	N/A	N/A	N/A AFTER O	3A116790
	* Q REG	NOT EQUAL	7FFF			3A116800
						3A116810
*****						3A116820
3129 0 0C43	DC	A800	OVD-8000			3A116830
	* 4000	7FFF	N/A	N/A	OFF AFTER LOO	3A116840
	* 8000	7FFF	N/A	N/A	N/A AFTER O	3A116850
	* OVERFLOW	ON-SHOULD	NOT 8E			3A116860
						3A116870
*****						3A116880
312A 0 0C43	DC	A800	OVD-8000			3A116890
	* 4000	7FFF	N/A	N/A	OFF AFTER LOO	3A116900
	* 8000	7FFF	N/A	N/A	N/A AFTER O	3A116910
	* CARRY	ON-SHOULD	NOT 8E			3A116920
						3A116930
*****						3A116940
312B 0 0C71	DC	A806	OVD-5555			3A116950
	* 1C71	88E3	N/A	N/A	N/A AFTER LDD	3A116960
	* 5555	2DAA	N/A	N/A	N/A AFTER O	3A116970
	* ACCUM	NOT EQUAL	5555			3A116980
						3A116990
						3A117000
						3A117010

*****						3A117020
*****						3A117030
ADDRESS						3A117040
OF						3A117050
8-REG ROUTINE						3A117060
*****						3A117070
*****						3A117080
312C 0 0C71	DC	A806	OVD-5555			3A117090
	* 1C71	88E3	N/A	N/A	N/A AFTER LDD	3A117100
	* 5555	2DAA	N/A	N/A	N/A AFTER D	3A117110
	* Q REG	NOT EQUAL	2DAA			3A117120
						3A117130
*****						3A117140
312D 0 0C71	DC	A806	OVD-5555			3A117150
	* 1C71	88E3	N/A	N/A	OFF AFTER LDD	3A117160
	* 5555	2DAA	N/A	N/A	N/A AFTER D	3A117170
	* OVERFLOW	ON-SHOULD	NOT 8E			3A117180
						3A117190
*****						3A117200
312E 0 0C71	DC	A806	OVD-5555			3A117210
	* 1C71	88E3	N/A	N/A	OFF AFTER LDD	3A117220
	* 5555	2DAA	N/A	N/A	N/A AFTER O	3A117230
	* CARRY	ON-SHOULD	NOT 8E			3A117240
						3A117250
*****						3A117260
312F 0 0C9A	DC	A80C	OVD-0000			3A117270
	* 0000	0001	N/A	N/A	OFF AFTER LOO	3A117280
	* N/A	N/A	N/A	N/A	O AFTER O	3A117290
	* OVERFLOW	NOT ON-SHOULD	8E OR Q-REG	NOT 1		3A117300
						3A117310
*****						3A117320
3130 0 0CA9	DC	A80E	OVD-0001			3A117330
	* 4000	0000	N/A	N/A	OFF AFTER LOO	3A117340
	* N/A	N/A	N/A	N/A	O AFTER O	3A117350
	* OVERFLOW	NOT ON-SHOULD	8E			3A117360
						3A117370
*****						3A117380
3131 0 0CB4	DC	8800	OVD-4000			3A117390
	* A000	0000	N/A	N/A	OFF AFTER LOO	3A117400
	* N/A	N/A	N/A	N/A	O AFTER O	3A117410
	* OVERFLOW	NOT ON-SHOULD	8E			3A117420
						3A117430
*****						3A117440
3132 0 0CBF	DC	8802	OVD-8000			3A117450
	* C000	0000	N/A	N/A	OFF AFTER LOO	3A117460
	* N/A	N/A	N/A	N/A	O AFTER D	3A117470
	* OVERFLOW	OFF--SHOULD	8E ON			3A117480
						3A117490
*****						3A117500
3133 0 0CCA	DC	8804	OVD-0001			3A117510
	* 0000	FFFF	N/A	N/A	OFF AFTER LOO	3A117520
	* N/A	N/A	N/A	N/A	O AFTER O	3A117530
	* OVERFLOW	OFF--SHOULD	8E ON			3A117540
						3A117550
*****						3A117560
3134 0 0CD5	DC	8806	OVD-0001			3A117570
	* FFFF	7FFF	N/A	N/A	OFF AFTER LDD	3A117580
	* N/A	N/A	N/A	N/A	O AFTER D	3A117590
	* OVERFLOW	OFF--SHOULD	8E ON			3A117600
						3A117610
*****						3A117620
3135 0 0056	DC	A840	MOX 1			3A117630
	* N/A	N/A	0000	N/A	N/A AFTER LDX	3A117640
	* N/A	N/A	FFFF	N/A	N/A AFTER MDX 1	3A117650
	* INOEX	REG 1	NOT EQUAL	FFFF	WHEN MD01F1EO	3A117660
	* 8Y	MINUS 1				3A117670
						3A117680
*****						3A117690
3136 0 0064	DC	A842	MOX LONG FORM			

***** * ADD C1 TO MEMDRY FAILED *****						3A117700
*****						3A117710
ADDRESS						3A117720
OF						3A117730
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS						3A117740
*****						3A117750
*						3A117760
3137 0 0079						3A117770
OC A844 MDX 2 LDNG FORM						3A117780
* N/A N/A N/A FFFE N/A N/A AFTER LDX						3A117790
* N/A N/A N/A FFFF N/A N/A AFTER MOX 2						3A117800
* INOEX REG 2 NDT EQUAL TO FFFF AFTER MDX C1						3A117810
* TO INDEX REG 2						3A117820
*						3A117830
3138 0 0088						3A117840
DC A846 MDX 3						3A117850
* N/A N/A N/A N/A FFFF N/A AFTER LOX						3A117860
* N/A N/A N/A N/A 0000 N/A AFTER MOX 2						3A117870
* MDX DID NOT CAUSE A SKIP WHEN INDEX REG 3						3A117880
* WENT TO 0000						3A117890
*						3A117900
3139 0 0092						3A117910
OC A848 MDX 1						3A117920
* N/A N/A FFFF N/A N/A N/A AFTER LDX						3A117930
* N/A N/A 0003 N/A N/A N/A AFTER MOX 1						3A117940
* MDX DID NOT CAUSE A SKIP WHEN THE SIGN						3A117950
* CHANGED ON INOEX REG 1						3A117960
*						3A117970
313A 0 009C						3A117980
DC A849 MOX 1 INDIRECT						3A117990
* N/A N/A FFFE N/A N/A N/A AFTER LDX						3A118000
* N/A N/A FFFF N/A N/A N/A AFTER LDX 11						3A118010
* INOIRECT MOX OF INDEX REG 1 8Y C1 FAILED						3A118020
*						3A118030
3138 0 00CF						3A118040
DC A880 SLCA-XR 1						3A118050
* 0000 N/A 0010 N/A N/A N/A AFTER LDX						3A118060
* 0000 N/A 0000 N/A N/A N/A AFTER SLCA						3A118070
* ACCUM NOT EQUAL 0000						3A118080
*						3A118090
313C 0 00CF						3A118100
OC A880 SLCA-XR 1						3A118110
* 0000 N/A 0010 N/A N/A N/A AFTER LOX						3A118120
* 0000 N/A 0000 N/A N/A N/A AFTER SLAC						3A118130
* INOEX REG 1 NOT EQUAL 0000						3A118140
*						3A118150
3130 0 00F6						3A118160
DC A884 SLCA-XR 1						3A118170
* 0001 N/A FF00 N/A N/A N/A AFTER LDX						3A118180
* 8000 N/A FFC1 N/A N/A N/A AFTER ASCL						3A118190
* ACCUM NDT EQUAL 8000						3A118200
*						3A118210
313E 0 0DF6						3A118220
OC A884 SLCA-XR 1						3A118230
* 0001 N/A FF00 N/A N/A N/A AFTER LDX						3A118240
* 8000 N/A FFC1 N/A N/A N/A AFTER LDX						3A118250
* INDEX REG 1 NOT EQUAL FFC1						3A118260
*						3A118270
313F 0 0E1E						3A118280
OC A888 SLCA-XR 1						3A118290
* 8000 N/A 0010 N/A N/A N/A AFTER LDX						3A118300
* 8000 N/A 0010 N/A N/A N/A AFTER SLCA						3A118310
* ACCUM NDT EQUAL 8000						3A118320
*						3A118330
3140 0 0E1E						3A118340
DC A888 SLCA-XR 1						3A118350
* 8000 N/A 0010 N/A N/A N/A AFTER LDX						3A118360
* 8000 N/A 0010 N/A N/A N/A AFTER SLCA						3A118370

***** * INDEX REG 1 NOT EQUAL 0010 *****						3A118380
*****						3A118390
ADDRESS						3A118400
OF						3A118410
B-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS						3A118420
*****						3A118430
*						3A118440
3141 0 0E59						3A118450
DC A88C SLC-XR 1						3A118460
* 0000 0000 0020 N/A N/A N/A AFTER LOX						3A118470
* 0000 0000 0000 N/A N/A N/A AFTER SLC						3A118480
* ACCUM NDT EQUAL 0000						3A118490
*						3A118500
3142 0 0E59						3A118510
OC A88C SLC-XR 1						3A118520
* 0000 0000 0020 N/A N/A N/A AFTER LDX						3A118530
* 0000 00C0 0000 N/A N/A N/A AFTER SLC						3A118540
* Q REG NOT EQUAL 0000						3A118550
*						3A118560
3143 0 0E59						3A118570
OC A88C SLC-XR 1						3A118580
* 0000 0000 0020 N/A N/A N/A AFTER LDX						3A118590
* 0000 0000 0000 N/A N/A N/A AFTER SLC						3A118600
* INDEX REG 1 NOT EQUAL 0000						3A118610
*						3A118620
3144 0 0E78						3A118630
DC 8882 SLC-XR 1						3A118640
* 0000 0002 FFDF N/A N/A N/A AFTER LOX						3A118650
* 8000 0000 FFC1 N/A N/A N/A AFTER SLC						3A118660
* ACCUM NOT EQUAL 8000						3A118670
*						3A118680
3145 0 0E78						3A118690
DC 8882 SLC-XR 1						3A118700
* 0000 0002 FF0F N/A N/A N/A AFTER LOX						3A118710
* 8000 0000 FFC1 N/A N/A N/A AFTER SLC						3A118720
* Q REG NOT EQUAL 0000						3A118730
*						3A118740
3146 0 0E78						3A118750
DC 8882 SLC-XR 1						3A118760
* 0000 0002 FFDF N/A N/A N/A AFTER LDX						3A118770
* 8000 0000 FFC1 N/A N/A N/A AFTER SLC						3A118780
* INDEX REG 1 NOT EQUAL FFC1						3A118790
*						3A118800
3147 0 0E9A						3A118810
DC 8884 SLC-XR 1						3A118820
* 0000 0002 001F N/A N/A N/A AFTER LOO&LDX						3A118830
* 8000 0000 0001 N/A N/A C AFTER SLC						3A118840
* A SLC TERMINATED BY A DNE 8IT IN ACCUM 8IT						3A118850
* ZERD DID NOT TURN DN CARRY						3A118860
*						3A118870
3148 0 0E9A						3A118880
DC 8884 SLC-XR 1						3A118890
* 0000 0002 001F N/A N/A N/A AFTER LOO&LDX						3A118900
* 8000 0000 0001 N/A N/A C AFTER SLC						3A118910
* ACCUM WAS NOT EQUAL TO 8000						3A118920
*						3A118930
3149 0 0E9A						3A118940
DC 8884 SLC-XR 1						3A118950
* 0000 0002 001F N/A N/A N/A AFTER LOO&LDX						3A118960
* 8000 0002 0001 N/A N/A C AFTER SLC						3A118970
* A SLC TERMINATED BY A ONE IN ACCUM BIT						3A118980
* ZERD DID NOT LEAVE XR 1 EQUAL 0001						3A118990
*						3A119000
314A 0 0E8A						3A119010
OC 8885 SLC-1X 1						3A119020
* 0000 0002 001C N/A N/A N/A AFTER LDD&LOX						3A119030
* 2000 0000 0000 N/A N/A DFF AFTER SLC						3A119040
* A SLC TERMINATED BY XR 1 GOING TO ZERO LEFT						3A119050

```
***** * THE CARRY FF SET 3A119060
*****
ADDRESS * 3A119070
OF * 3A119080
B-KEG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A119090
***** 3A119100
***** 3A119110
* 3A119120
* 3A119130
3148 D DED6 * DC B8A0 CMP A GREATER M 3A119140
* 4000 N/A N/A N/A N/A N/A 3A119150
* A GREATER THAN M CMP FAILED 3A119160
* 3A119170
* 3A119180
314C 0 OED6 * DC B8A0 CMP A GREATER M 3A119190
* 4000 N/A N/A N/A N/A N/A AFTER LD 3A119200
* 400D N/A N/A N/A N/A N/A AFTER CMP 3A119210
* ACC DESTROYED AFTER CMP 3A119220
* 3A119230
* 3A119240
3140 D OEF1 * DC B8A1 CMP A LESS M 3A119250
* 0000 N/A N/A N/A N/A N/A 3A119260
* ACC LESS THAN M FAILS 3A119270
* 3A119280
* 3A119290
314E D DEF8 * DC B8A2 CMP A LESS M 3A119300
* 0000 N/A N/A N/A N/A N/A 3A119310
* ACC LESS THAN M FAILS 3A119320
* 3A119330
* 3A119340
314F 0 OF05 * DC B8A3 CMP A LESS M 3A119350
* 0000 N/A N/A N/A N/A N/A 3A119360
* ACC LESS THAN M FAILS 3A119370
* 3A119380
* 3A119390
3150 0 OF0F * DC B8A4 CMP A LESS M 3A119400
* 8000 N/A N/A N/A N/A N/A 3A119410
* ACC LESS THAN M FAILS 3A119420
* 3A119430
* 3A119440
3151 0 DF19 * DC B8A5 CMP A EQ M 3A119450
* 1000 N/A N/A N/A N/A N/A 3A119460
* ACC EQ M FAILED 3A119470
* 3A119480
* 3A119490
3152 D DF24 * DC 88C0 DCM AQ GTR M,M&1 3A119500
* 8000 0001 N/A N/A N/A N/A 3A119510
* DCM AQ GREATER THAN M, M&1 FAILED 3A119520
* 3A119530
* 3A119540
3153 0 OF24 * DC 88C0 DCM AQ GTR M, M&1 3A119550
* 8000 0001 N/A N/A N/A N/A 3A119560
* ACC DESTROYED AFTER DCM 3A119570
* 3A119580
* 3A119590
3154 0 OF24 * DC 88C0 DCM AQ GTR M,M&1 3A119600
* 8000 0001 N/A N/A N/A N/A 3A119610
* 0 REG DESTROYED AFTER DCM 3A119620
* 3A119630
* 3A119640
3155 0 OF3E * DC 88C1 DCM AQ LESS M,M&1 3A119650
* 0000 8000 N/A N/A N/A N/A 3A119660
* DCM FAILED WHEN A,0 LESS THAN M, M&1 3A119670
* 3A119680
* 3A119690
3156 0 OF46 * DC 88C2 DCM AQ EQ M,M&1 3A119700
* 0000 8000 N/A N/A N/A N/A 3A119710
* DCM FAILED WHEN A,Q EQ M, M&1 3A119720
* 3A119730
```

```
***** * 3A119740
***** 3A119750
ADDRESS * 3A119760
OF * 3A119770
B-KEG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS 3A119780
***** 3A119790
***** 3A119800
3157 0 087F * DC A660 LDX 1 -1 3A119810
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A119820
* N/A N/A FFFF 0000 0000 N/A AFTER LDX 1 3A119830
* INDEX 2 CHANGED 3A119840
* 3A119850
3158 0 087F * DC A660 LDX 1 -1 3A119860
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A119870
* N/A N/A FFFF 0000 0000 N/A AFTER LDX 1 3A119880
* INDEX 3 CHANGED 3A119890
* 3A119900
* 3A119910
3159 0 0897 * DC A662 LDX 2 -1 3A119920
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A119930
* N/A N/A 0000 FFFF 0000 N/A AFTER LDX 2 3A119940
* INDEX 1 CHANGED 3A119950
* 3A119960
* 3A119970
315A 0 0897 * DC A662 LDX 2 -1 3A119980
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A119990
* N/A N/A 0000 FFFF 0000 N/A AFTER LDX 2 3A120000
* INDEX 3 CHANGED 3A120010
* 3A120020
* 3A120030
315B 0 08AF * DC A664 LDX 3 -1 3A120040
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A120050
* N/A N/A 0000 0000 FFFF N/A AFTER LDX 3 3A120060
* INDEX 1 CHANGED 3A120070
* 3A120080
* 3A120090
315C 0 08AF * DC A664 LDX 3 -1 3A120100
* N/A N/A 0000 0000 0000 N/A AFTER LDX#5 3A120110
* N/A N/A 0000 0000 FFFF N/A AFTER LDX 3 3A120120
* INDEX 2 CHANGED 3A120130
* 3A120140
* 3A120150
315D 0 09DC * DC A6D0 INDEXED INST F#0 3A120160
* INITIALLY XR 1 HAS CORE LOCATION OF 3A120170
* SYMBOLIC LABEL N6C1 3A120180
* AFTER THE TEST THE ACC SHOULD HAVE 3A120190
* CORE LOCATION OF SYMBOLIC LABEL N6C0 3A120200
* SHORT FORM INDEXED INST FAILED XX#1 3A120210
* 3A120220
* 3A120230
315E 0 09ER * DC A6D2 INDEXED INST F#0 3A120240
* INITIALLY XR 2 HAS CORE LOCATION OF 3A120250
* SYMBOLIC LABEL N6C1 3A120260
* AFTER THE TEST THE ACC SHOULD HAVE 3A120270
* CORE LOCATION OF SYMBOLIC LABEL N6C2 3A120280
* SHORT FORM INDEXED INST FAILED XX#2 3A120290
* 3A120300
* 3A120310
315F 0 09F4 * DC A6D3 INDEXED INST F#0 3A120320
* INITIALLY XR 3 HAS CORE LOCATION OF 3A120330
* SYMBOLIC LABEL N6C1 3A120340
* AFTER THE TEST THE ACC SHOULD HAVE 3A120350
* CORE LOCATION OF SYMBOLIC LABEL N6C1 3A120360
* SHORT FORM INDEXED INST. FAILED XX#3 3A120370
* 3A120380
* 3A120390
* 3A120400
* 3A120410
```

```
*
*****
ADDRESS *
OF *
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
3160 0 00CF DC A880 SLCA CK CARRY
* 00DD FFFF 000A N/A N/A C AFTER LOD&LOS
* 00DD FFFF 0000 N/A N/A OFF AFTER STS
* CARRY ON SHOULD BE OFF
*
3161 0 00F6 DC A884 SLCA CK CARRY
* 0001 0010 FF00 N/A N/A OFF AFTER LOD&LOX
* 80DD 0010 FF01 N/A N/A C AFTER SLCA
* CARRY OFF, SHOULD BE ON
*
3162 0 0E38 DC A889 NON INDEXED SLCA
* 0001 N/A 0010 0010 0010 N/A AFTER LO
* 0002 N/A N/A N/A N/A N/A AFTER SLCA
* SLCA T#0 FAILED
*
3163 0 0A00 DC A6D5 INDEXED SLA
* 0001 N/A 0002 N/A N/A N/A AFTER LD&LDX
* 0DD4 N/A N/A N/A N/A N/A AFTER SLA
* INDEXED SLA FAILED
*
3164 0 0A0C DC A6D6 INDEXED SRA
* 0DD4 N/A N/A 0002 N/A N/A N/A AFTER LD&LO
* 0D01 N/A N/A N/A N/A N/A AFTER SRA
* INDEXED SRA FAILED
*
3165 0 0A18 DC A6F0 INDEXED BSC
* INITIALLY ACC HAS CORE LOCATION OF
* SYMBOLIC LABEL N6F1
* ACC DESTROYED AFTER INDEXED BSC
*
3166 0 0A29 DC A6F1 INDIR, INDEX BSC
* N/A N/A 0001 N/A N/A N/A AFTER LOX
* N/A N/A N/A N/A N/A AFTER BSC
* INDIRECT, INDEXED BSC FAILED
*
3167 0 0810 DC A640 STX CK ACC
* INITIALLY ACC HAS CORE LOCATION OF
* SYMBOLIC LABEL H640
* ACC DESTROYED AFTER STX
*
3168 0 0D9C DC A849 MDX CK ACC
* INITIALLY ACC HAS CORE LOCATION OF
* SYMBOLIC LABEL H849
* ACC DESTROYED AFTER MDX
*
3169 0 08C9 DC A670 ACC DECODE
* 0001 N/A 0010 N/A N/A N/A
* 0D0D N/A 0000 N/A N/A N/A
* FALSE DECODE OF ACC BE ZERO
* * EACH BIT POSITION IS TESTED
*
```

```
*
*****
ADDRESS *
OF *
8-REG ROUTINE * A-REG Q-REG XR-1 XR-2 XR-3 STATUS
*****
316A D 00D4 DC B807 DVD OVFL0
* 6100 00DD N/A N/A N/A OFF AFTER LDD
* N/A N/A N/A N/A N/A 0 AFTER D
* OVFL0 NOT ON
*
316B D 0D0F DC 8808 DVD OVFL0
* B0D0 0000 N/A N/A N/A OFF AFTER LDD
* N/A N/A N/A N/A N/A 0 AFTER D
* OVFL0 NOT ON
*
316C 0 0D1A DC 8809 OVD NO OVFL0
* FFFF FFFF N/A N/A N/A OFF AFTER LDD
* N/A N/A N/A N/A N/A OFF AFTER D
* OVFLD ON, SHOULD BE OFF
*
316D 0 0D26 DC BB10 MPY-DIV ZERO REM
* ACC WRONG AFTER MPY-DIV TEST
*
316E 0 0D26 DC BB10 MPY-DIV ZERO REM
* Q REG WRONG AFTER MPY-DIV TEST
*
316F 0 0D64 DC A842 MOX CK ACC
* INITIALLY ACC HAS CORE LOCATION OF
* SYMBOLIC LABEL N844
* ACC DESTROYED AFTER ADD TO MEMORY
*
3170 0 05FC DC A50A BSC CK ACC
* BDD1 N/A N/A N/A N/A N/A AFTER LO
* 8D01 N/A N/A N/A N/A N/A AFTER BSC
* ACC DESTROYED AFTER BSC CONDITIONS MET
*
3171 0 0DB2 DC A84A MOX MEM CK SKIP
* MEMORY LOC HAS ZERO
* MDX FAILED TO SKIP
*
3172 0 0DBC DC A85A MOX MEM CK NO SKP
* MEMORY LOC IS NON ZERO
* MDX SKIPPED, SHOULD NOT HAVE
*
3173 0 0E48 DC A88A SW 15 NO INDEX
* 00D0 FFFF 0010 0010 0010 N/AFTER LD&XS
* 7FFF N/A N/A N/A N/A N/AFTER SLC
* ACCUM NOT EQ TO 7FFF
*
3174 0 0F69 DC F0D0 IMPROPER CONTROL
* OPERATION SPECIFIED,
* BIT SW 14 ON WITHOUT
* BIT SW 8 OR 12 ON.
* CORRECT SWS AND PUSH
* START TO CONTINUE
*
```

```
*****
*****
*****
3175      ORG      300
012C 0 03A1  DC      /D3A1      PID
*****
*****
*****
TEST MDX OPERATION
*****
*****
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
012D 0 3000    X000 DC      /3000    SET SWITCHES TO RUN
012E 0 7001    A080 MDX      G080
012F 0 3004          OC      /3004    ERR ID & ERR WAIT
                                         MOX BY 1 FAILED
0130 0 7002    G080 MOX      G081
0131 0 3005          DC      /3005    ERR ID & ERR WAIT
                                         MOX BY 2 FAILED
0132 0 3006          DC      /3006    ERR ID & ERR WAIT
                                         MOX BY 2 FAILED
0133 0 7004    G081 MOX      G082
0134 0 3007          DC      /3007    ERR ID & ERR WAIT
                                         MOX BY 4 FAILED
0135 0 3008          DC      /3008    ERR ID & ERR WAIT
                                         MOX BY 4 FAILED
0136 0 3009          OC      /3009    ERR ID & ERR WAIT
                                         MOX BY 4 FAILED
0137 0 300A          DC      /300A    ERR ID & ERR WAIT
                                         MOX BY 4 FAILED
0138 0 7002    G082 MDX      G084
0139 0 3008          OC      /3008    ERR ID & ERR WAIT
                                         MOX BY 2 FAILED
013A 0 7004    G083 MDX      A0C0
013B 0 70FE    G084 MOX      G083
013C 0 300C          DC      /300C    ERR ID & ERR WAIT
                                         MOX BY -2 FAILED
0130 0 300D          OC      /300D    ERR ID & ERR WAIT
                                         MOX BY -2 FAILED
013E 0 300E          DC      /300E    ERR ID & ERR WAIT
                                         MOX BY -2 FAILED
*****
*****
*****
TEST OF BSC SKIP WHEN IT
SHOULD NOT
*****
*****
013F 0 2003    A0C0 LDS      3      SET C AND OF DN
0140 0 4802          BSC      C      SK IF CARRY IS OFF
0141 0 7002          MOX      G0C1
0142 0 300F          OC      /300F    ERR ID & ERR WAIT
                                         BSC-CARRY FAILED
0143 0 0000    N100 OC      0
0144 0 4801    G0C1 BSC      D
0145 0 7001          MDX      G0C2
0146 0 3010          DC      /3010    ERR ID & ERR WAIT
                                         BSC-OVERFLOW FAILED
0147 0 4801    G0C2 BSC      D      CK IF OF WAS RESET
0148 0 3011          DC      /3011    ERR ID & ERR WAIT
                                         BSC-OVFLW SKPD-SHOLD
                                         *NOT HAVE
0149 0 2000          LOS      0      RESET CARRY TO OFF
014A 0 4802          BSC      C      SK IF CARRY IS OFF
014B 0 3012          OC      /3012    ERR ID & ERR WAIT
                                         BSC-C DIO NOT SKIP
*****
*****
```

3A121780
3A121790
3A121800
3A121810
3A121820
3A121830
3A121840
3A121850
3A121860
3A121870
3A121880
3A121890
3A121900
3A121910
3A121920
3A121930
3A121940
3A121950
3A121960
3A121970
3A121980
3A121990
3A122000
3A122010
3A122020
3A122030
3A122040
3A122050
3A122060
3A122070
3A122080
3A122090
3A122100
3A122110
3A122120
3A122130
3A122140
3A122150
3A122160
3A122170
3A122180
3A122190
3A122200
3A122210
3A122220
3A122230
3A122240
3A122250
3A122260
3A122270
3A122280
3A122290
3A122300
3A122310
3A122320
3A122330
3A122340
3A122350
3A122360
3A122370
3A122380
3A122390
3A122400
3A122410
3A122420
3A122430
3A122440
3A122450

```
*****
*****
*****
TEST OF ACC ABILITY TO HOLD
ALL ZEROS
*****
*****
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
014C 0 C0F6    A100 LO      N100    LD /0000
0140 0 4820          BSC      Z      SK IF ZERO
014E 0 3013          DC      /3013    ERR ID & ERR WAIT
                                         LD ACC TO 0 FAILED
014F 0 C0F3          LD      N100    ACC#0,RELOAD TO 0
0150 0 4820          BSC      Z      SK IF ZERO
0151 0 3014          DC      /3014    ERR ID & ERR WAIT
                                         LD ACC TO 0 FAILED
0152 0 4804          BSC      E
0153 0 3015          DC      /3015    ERR ID & ERR WAIT
                                         BSC ON EVEN FAILED
*****
*****
*****
CONTAIN ALL ONES
*****
*****
*****
0154 0 C04A    A140 LO      N140    ACC.#0,RELOAD TO ONES
0155 0 4810          BSC      -
0156 0 3016          DC      /3016    SK IF MINUS
                                         ERR ID & ERR WAIT
                                         LDAO ACC. FAILED OR
                                         *BSC ON NEG. FAILED
0157 0 4808          BSC      E
0158 0 7001          MOX      G140
0159 0 3017          DC      /3017    ERR ID & ERR WAIT
                                         BSC DN & SKPD-
                                         *SHOULD NOT HAVE
015A 0 4804    G140 BSC      E
015B 0 7001          MOX      G141
015C 0 3018          OC      /3018    ERR ID & ERR WAIT
                                         BSC DN-E SKPD-
                                         *SHOULD NOT HAVE
015D 0 1801    G141 SRA      1
015E 0 4804          BSC      E
015F 0 7001          MOX      G142
0160 0 3019          DC      /3019    ERR ID & ERR WAIT
                                         ACC NOT # 7FFF
0161 0 1801    G142 SRA      1
0162 0 4804          BSC      E
0163 0 7001          MOX      G143
0164 0 301A          DC      /301A    ERR ID & ERR WAIT
                                         ACC NOT # 3FFF
0165 0 1801    G143 SRA      1
0166 0 4804          BSC      E
0167 0 7001          MDX      G144
0168 0 301B          DC      /301B    ERR ID & ERR WAIT
                                         ACC NOT # 1FFF
0169 0 1801    G144 SRA      1
016A 0 4804          BSC      E
016B 0 7001          MOX      G145
016C 0 0000          DC      /301C    ERR ID & ERR WAIT
                                         ACC NOT # 0FFF
016D 0 1801    G145 SRA      1
016E 0 4804          BSC      E
016F 0 7001          MOX      G146
0170 0 301D          DC      /301D    ERR ID & ERR WAIT
                                         ACC NOT # 07FF
0171 0 1801    G146 SRA      1
0172 0 4804          BSC      E
0173 0 7001          MOX      G147
0174 0 301E          DC      /301E    ERR ID & ERR WAIT
                                         ACC NOT # 03FF
0175 0 1801    G147 SRA      1
0176 0 4804          BSC      E
```

3A122460
3A122470
3A122480
3A122490
3A122500
3A122510
3A122520
3A122530
3A122540
3A122550
3A122560
3A122570
3A122580
3A122590
3A122600
3A122610
3A122620
3A122630
3A122640
3A122650
3A122660
3A122670
3A122680
3A122690
3A122700
3A122710
3A122720
3A122730
3A122740
3A122750
3A122760
3A122770
3A122780
3A122790
3A122800
3A122810
3A122820
3A122830
3A122840
3A122850
3A122860
3A122870
3A122880
3A122890
3A122900
3A122910
3A122920
3A122930
3A122940
3A122950
3A122960
3A122970
3A122980
3A122990
3A123000
3A123010
3A123020
3A123030
3A123040
3A123050
3A123060
3A123070
3A123080
3A123090
3A123100
3A123110
3A123120
3A123130

```
0177 0 7001      MOX      G148
0178 0 301F      OC       /301F      ERR ID & ERR WAIT
                                     ACC NOT # 01FF
0179 0 1801      * G148 SRA      1
017A 0 4804      8SC      E
0178 0 7001      MOX      G149
017C 0 3020      OC       /3020      ERR ID & ERR WAIT
                                     ACC NOT # 00FF
0170 0 1801      * G149 SRA      1
017E 0 4804      8SC      E
017F 0 7001      MDX      G14A
0180 0 3021      OC       /3021      ERR ID & ERR WAIT
                                     ACC NOT # D07F
0181 0 1801      * G14A SRA      1
0182 0 4804      8SC      E
0183 0 7001      MDX      G148
0184 0 3022      OC       /3022      ERR ID & ERR WAIT
                                     ACC NDT # 003F
0185 0 1801      * G148 SRA      1
0186 0 4804      8SC      E
0187 0 7001      MDX      G14C
0188 0 3023      OC       /3023      ERR ID & ERR WAIT
                                     ACC NDT # D01F
0189 0 1801      * G14C SRA      1
018A 0 4804      8SC      E
018B 0 7001      MDX      G14D
018C 0 3024      DC       /3024      ERR ID & ERR WAIT
                                     ACC NDT # 000F
018D 0 1801      * G14D SRA      1
018E 0 4804      8SC      E
018F 0 7001      MDX      G14E
0190 0 3025      DC       /3025      ERR ID & ERR WAIT
                                     ACC NDT # D007
0191 0 1801      * G14E SRA      1
0192 0 4804      8SC      E
0193 0 7001      MOX      G14F
0194 0 3026      OC       /3026      ERR ID & ERR WAIT
                                     ACC NDT # 0003
0195 0 1801      * G14F SRA      1
0196 0 4804      8SC      E
0197 0 7001      MDX      G150
0198 0 3027      DC       /3027      ERR ID & ERR WAIT
                                     ACC NOT # 0001
0199 0 1801      * G150 SRA      1
019A 0 4804      8SC      E
0198 0 3028      DC       /3028      ERR ID & ERR WAIT
                                     ACC NDT # 0000
019C 0 4820      *      8SC      Z
0190 0 3029      OC       /3029      ERR ID & ERR WAIT
                                     ACC NOT # 0000
019E 0 7001      *      MDX      A180
019F 0 FFFF      N140 DC      /FFFF      EXIT TO NEXT ROUTINE
*
* TEST LDING DF DNES DN ONES
*
*****
CORE DATA OR *LA- DPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
01A0 0 C049      A180 LO      N180      LD /FFFF
01A1 0 482C      8SC      6E2      SK DN & EVEN OR ZERO
01A2 0 4810      8SC      -      SK IF MINUS
01A3 0 302A      DC       /302A      ERR ID & ERR WAIT
                                     ACC NDT # FFFF
01A4 0 C045      *      LO      N180      LD /FFFF
01A5 0 482C      8SC      6E2
01A6 0 4810      BSC      -
```

3A123140
3A123150
3A123160
3A123170
3A123180
3A123190
3A123200
3A123210
3A123220
3A123230
3A123240
3A123250
3A123260
3A123270
3A123280
3A123290
3A123300
3A123310
3A123320
3A123330
3A123340
3A123350
3A123360
3A123370
3A123380
3A123390
3A123400
3A123410
3A123420
3A123430
3A123440
3A123450
3A123460
3A123470
3A123480
3A123490
3A123500
3A123510
3A123520
3A123530
3A123540
3A123550
3A123560
3A123570
3A123580
3A123590
3A123600
3A123610
3A123620
3A123630
3A123640
3A123650
3A123660
3A123670
3A123680
3A123690
3A123700
3A123710
3A123720
3A123730
3A123740
3A123750
3A123760
3A123770
3A123780
3A123790
3A123800
3A123810

```
01A7 0 3028      * DC       /3028      ERR ID & ERR WAIT
                                     ACC NOT # FFFF
01A8 0 1801      * SRA      1      TEST ABILITY DF ACC TO SHIFT
01A9 0 4804      *      8SC      E
01AA 0 7001      MDX      G181
01A8 0 302C      DC       /302C      ERR ID & ERR WAIT
                                     ACC NDT # 7FFF
01AC 0 1801      * G181 SRA      1
01AD 0 4804      8SC      E
01AE 0 7001      MDX      G182
01AF 0 302D      OC       /302D      ERR ID & ERR WAIT
                                     ACC NDT # 3FFF
0180 D 1801      * G182 SRA      1
0181 D 4804      8SC      E
0182 D 7001      MDX      G183
0183 D 302E      DC       /302E      ERR ID & ERR WAIT
                                     ACC NDT # 1FFF
0184 D 1801      * G183 SRA      1
0185 D 4804      8SC      E
0186 D 7001      MDX      G184
0187 D 302F      DC       /302F      ERR ID & ERR WAIT
                                     ACC NDT # 00FF
0188 D 1801      * G184 SRA      1
0189 D 4804      8SC      E
018A D 7001      MDX      G185
018B D 3030      OC       /3030      ERR ID & ERR WAIT
                                     ACC NDT # 07FF
018C D 1801      * G185 SRA      1
018D D 4804      8SC      E
018E D 7001      MDX      G186
018F D 3031      DC       /3031      ERR ID & ERR WAIT
                                     ACC NOT # 03FF
01C0 0 1801      * G186 SRA      1
01C1 0 4804      8SC      E
01C2 0 7001      MDX      G187
01C3 0 3032      DC       /3032      ERR ID & ERR WAIT
                                     ACC NDT # 01FF
01C4 0 1801      * G187 SRA      1
01C5 0 4804      8SC      E
01C6 0 7001      MDX      G188
01C7 0 3033      DC       /3033      ERR ID & ERR WAIT
                                     ACC NDT # 00FF
01C8 0 1801      * G188 SRA      1
01C9 0 4804      8SC      E
01CA 0 7001      MDX      G189
01CB 0 3034      OC       /3034      ERR ID & ERR WAIT
                                     ACC NDT # 007F
01CC D 1801      * G189 SRA      1
01CD D 4804      8SC      E
01CE D 7001      MDX      G18A
01CF D 3035      DC       /3035      ERR ID & ERR WAIT
                                     ACC NDT # 003F
01D0 D 1801      * G18A SRA      1
01D1 D 4804      8SC      E
01D2 D 7001      MDX      G188
01D3 D 3036      OC       /3036      ERR ID & ERR WAIT
                                     ACC NOT # 001F
01D4 0 1801      * G188 SRA      1
01D5 D 4804      8SC      E
01D6 D 7001      MDX      G18C
01D7 0 3037      DC       /3037      ERR ID & ERR WAIT
                                     ACC NDT # 000F
01D8 0 1801      * G18C SRA      1
01D9 0 4804      8SC      E
01DA 0 7001      MDX      G18D
01DB 0 3038      DC       /3038      ERR ID & ERR WAIT
                                     ACC NDT # 0007
```

3A123820
3A123830
3A123840
3A123850
3A123860
3A123870
3A123880
3A123890
3A123900
3A123910
3A123920
3A123930
3A123940
3A123950
3A123960
3A123970
3A123980
3A123990
3A124000
3A124010
3A124020
3A124030
3A124040
3A124050
3A124060
3A124070
3A124080
3A124090
3A124100
3A124110
3A124120
3A124130
3A124140
3A124150
3A124160
3A124170
3A124180
3A124190
3A124200
3A124210
3A124220
3A124230
3A124240
3A124250
3A124260
3A124270
3A124280
3A124290
3A124300
3A124310
3A124320
3A124330
3A124340
3A124350
3A124360
3A124370
3A124380
3A124390
3A124400
3A124410
3A124420
3A124430
3A124440
3A124450
3A124460
3A124470
3A124480
3A124490

CPU FUNCTION TEST

G236 0 4C0B 023A	*	BSC	L	G202,6	8SC SKPD-SHOULD BRNCH	3A125860
0238 0 304E		OC		/304E	8R IF NOT PLUS	3A125870
	*				ERR IO & ERR WAIT	3A125880
0239 0 304F		OC		/304F	BSC - OIO NOT BRANCH	3A125890
	*				ERR IO & ERR WAIT	3A125900
					8SC SKPD-SHOULD BRNCH	3A125910
023A 0 4C20 023E	G202	BSC	L	G203,Z		3A125920
023C 0 3050		OC		/3050	ERR IO & ERR WAIT	3A125930
	*				8SC Z OIO NOT SKIP	3A125940
0230 0 3051		OC		/3051	ERR IO & ERR WAIT	3A125950
	*				BSC SKPD-SHOULD BRNCH	3A125960
G23E 0 4C10 0241	G203	BSC	L	V154,-	8R IF NOT MINUS	3A125970
0240 0 7001		MOX		G204		3A125980
0241 0 3052		OC		/3052	ERR IO & ERR WAIT	3A125990
	*				8SC SKPD-SHOULD NOT	3A126000
0242 0 2003	G204	LOS		3	SET C AND OF ON	3A126010
0243 0 4C02 0247		BSC	L	G205,C	8R IF CARRY IS ON	3A126020
0245 0 3053		OC		/3053	ERR IO & ERR WAIT	3A126030
	*				8SC C OIO NOT BRANCH	3A126040
0246 0 3054		OC		/3054	ERR IO & ERR WAIT	3A126050
	*				BSC SKPD-SHOULD BRNCH	3A126060
0247 0 4C01 0248	G205	BSC	L	G208,0	8R IF OF ON	3A126070
0249 0 3055		OC		/3055	ERR IO & ERR WAIT	3A126080
	*				BSC O OIO NOT BRANCH	3A126090
024A 0 3056		OC		/3056	ERR IO & ERR WAIT	3A126100
	*				8SC SKPD-SHOULD BRNCH	3A126110
024B 0 4C01 024E	G208	BSC	L	V168,0	8R IF OF ON	3A126120
0240 0 7001		MOX		G206		3A126130
024E 0 3057		OC		/3057	ERR IO & ERR WAIT	3A126140
	*				8SC BRNCD-SHOULD NOT	3A126150
024F 0 2000	G206	LOS		0		3A126160
0250 0 4C02 0253		BSC	L	V170,C	8R IF CARRY IS OFF	3A126170
0252 0 7001		MOX		G207		3A126180
0253 0 3058		OC		/3058	ERR IO & ERR WAIT	3A126190
	*				BSC BRNCD-SHOULD NOT	3A126200
0254 0 4C01 0257	G207	BSC	L	V174,0	8R IF OF ON	3A126210
0256 0 7001		MOX		G209		3A126220
0257 0 3059		OC		/3059	ERR IO & ERR WAIT	3A126230
	*				BSC BRNCD-SHOULD NOT	3A126240
0258 0 C014	G209	LO		N201		3A126250
0259 0 4C18 0250		BSC	L	G20A,-	8R ON ZERO	3A126260
0258 0 305A		OC		/305A	ERR IO & ERR WAIT	3A126270
	*				8SC - OIO NOT BRANCH	3A126280
025C 0 305B		OC		/305B	ERR IO & ERR WAIT	3A126290
	*				8SC SKPD-SHOULD BRNCH	3A126300
0250 0 C00E	G20A	LO		N200		3A126310
025E 0 4C18 0261		BSC	L	V180,-		3A126320
0260 0 7001		MOX		G20D		3A126330
0261 0 305C		OC		/305C	ERR IO & ERR WAIT	3A126340
	*				8SC BRNCD-SHOULD NOT	3A126350
0262 0 C008	G200	LO		N202		3A126360
0263 0 4C1B 0266		BSC	L	V184,-		3A126370
0265 0 7001		MOX		G208		3A126380
0266 0 3050		OC		/3050	ERR IO & ERR WAIT	3A126390
	*				8SC BRNCD-SHOULD NOT	3A126400
0267 0 4C80 026F	G20B	BSC	I	N203		3A126410
0269 0 305E		OC		/305E	ERR IO & ERR WAIT	3A126420
	*				INDIRECT BSC FAILED	3A126430
026A 0 305F		OC		/305F	ERR IO & ERR WAIT	3A126440
	*				INDIRECT BSC FAILED	3A126450
026B 0 7004	G20C	MOX		A240		3A126460
026C 0 FFFF		OC		/FFFF		3A126470
0260 0 0000	N201	OC		/0000		3A126480
026E 0 0001	N202	OC		/0001		3A126490
026F 0 026B	N203	OC		G20C		3A126500
	*					3A126510
	*				TEST SHORT AND LONG FORM	3A126520
	*				BSI	3A126530

CPU FUNCTION TEST

	*					3A126540
	*****					3A126550
CORE DATA OR	*LA- OPER-					3A126560
A00R INSTRUCTION	*BEL ATION FT OPERANOS & REMARKS	IOSEQ#	AT RIGHT			3A126570
	*****					3A126580
0270 0 4002	A240	BSI	N241	STORE ADDRESS OF I REG		3A126590
0271 0 0271	N240	OC	N240	STORE ADDRESS OF I REG		3A126600
0272 0 3060		OC	/3060	ERR IO & ERR WAIT		3A126610
	*					3A126620
0273 0 0000	N241	OC	/0000	BSI SKPD-SHOULD BRNCH		3A126630
0274 0 C0FE		LO	N241	RETURN ADDR FOR MAIN PROG		3A126640
0275 0 F0FB		EOR	N240	LO RETURN ADDR		3A126650
0276 0 4B20		BSC	Z	ZERO IN RETURN ADDR		3A126660
0277 0 3061		OC	/3061	ERR IO & ERR WAIT		3A126670
	*					3A126680
027B 0 440B 027D	BSI	L	N243,6	BSI NOT STORED I REG		3A126690
027A 0 3062	V1AC	OC	/3062	STORE ADDR OF I REG		3A126700
	*			ERR IO & ERR WAIT		3A126710
027B 0 3063		OC	/3063	BSI & OIO NOT BRANCH		3A126720
	*			ERR IO & ERR WAIT		3A126730
				BSI SKPD-SHOULD BNCH		3A126740
027C 0 027A	N242	OC	V1AC			3A126750
0270 0 0000	N243	OC	/0000	RETURN ADDR FOR MAIN PROG		3A126760
027E 0 C0FE		LO	N243			3A126770
027F 0 F0FC		EOR	N242			3A126780
0280 0 4B20		BSC	Z			3A126790
0281 0 3064		OC	/3064	ERR IO & ERR WAIT		3A126800
	*			BSI NOT STORE I REG		3A126810
	*					3A126820
	*			TEST OF INSTR REQUIRED FOR		3A126830
	*			ERROR CONTROL		3A126840
	*					3A126850
	*****					3A126860
0282 0 C048	A900	LO	F911	LO A NUMBER		3A126870
0283 0 004B		STO	F912			3A126880
0284 0 C048		LO	F913			3A126890
0285 0 C046		LO	F912			3A126900
0286 0 F044		EOR	F911			3A126910
0287 0 4B20		BSC	Z			3A126920
0288 0 3065		OC	/3065	ERR IO & ERR WAIT		3A126930
	*			STORE FAILED		3A126940
0289 0 C047		LO	F91B	CK FIRST PASS SW %/0002B		3A126950
028A 0 4B20		BSC	Z	IS SW ON		3A126960
028B 0 704C		MOX	A2B0	YES GO TO NEXT ROUTINE		3A126970
028C 0 C042		LO	F916	GET 0002		3A126980
028D 0 0043		STO	F91B	STORE /0002		3A126990
028E 0 1B10		SRA	16	CLEAR ACC		3A127000
028F 0 0400 0001		STO	L /0001	ZERO WITH /0001		3A127010
0291 0 61FF		LOX	1 -1	LO XR 1 WITH -1		3A127020
0292 0 C400 0001		LO	L /0001	ZERO IN 1800 -1 FOR 1130		3A127030
0294 0 4B20		BSC	Z	ZERO FOR 1800		3A127040
0295 0 700F		MOX	G901	1130 CPU		3A127050
0296 0 C03B		LO	F919	1800 P-C LO /0240		3A127060
0297 0 0031		STO	F903	STO /0240 THIS IS AREA,		3A127070
0298 0 0400 0F67		STO	L N8C2	* FUNCTION AND MODIFIER		3A127080
029A 0 0400 0F03		STO	L F004	* FOR READING DATA ENTRY		3A127090
029C 0 003A		STO	F007	* SWITCHES IN 1800		3A127100
0290 0 0B36	G902	XIO	F922	SENSE SENSE/PROG SWS		3A127110
029E 0 E037		AND	F923	IGNORE CE SWS. %/FF00B		3A127120
029F 0 F036		EOR	F923	ZERO WITH /FF00		3A127130
	*****					3A127140
CORE DATA OR	*LA- OPER-					3A127150
A00R INSTRUCTION	*BEL ATION FT OPERANOS & REMARKS	IOSEQ#	AT RIGHT			3A127160
	*****					3A127170
02A0 0 4C1B 02AC	BSC	L	G900,-	BRANCH ON ZERO		3A127180
02A2 0 F033		EOR	F923			3A127190
02A3 0 3066		OC	/3066	ERROR IO & ERR WAIT		3A127200
	*			SENSE/PROG SWS NOT		3A127210

Address	Operation	Register	Condition	Instruction	Comment	Hex
02A4	0	70F8				
02A5	0	C020				
02A6	0	0022				
02A7	0	0400	OF67			
02A9	0	0400	OF03			
02A8	0	0028				
02AC	0	0818				
02A0	0	C022				
02AE	0	F01F				
02AF	0	4C18	0284			
0281	0	F01C				
0282	0	3067				
0283	0	70F8				
0284	0	3001				
0285	0	C013				
0286	0	F01C				
0287	0	4C18	028F			
0289	0	081A				
028A	0	E018				
0288	0	4C18	028F			
0280	0	3068				
028E	0	70FA				
028F	0	0808				
02C0	0	C00F				
02C1	0	4C18	02C5			
02C3	0	3069				
02C4	0	70FA				
02C5	0	3002				
02C6	0	7011				
02C8	0	0000				
02C8	0	02D0				
02C9	0	0240				
02CA	0	02CA				
02C8	0	02CC				
02CC	0	0000				
02C0	0	0000				
02CE	0	FFFF				
02CF	0	0002				
0200	0	0000				
0201	0	0000				
0202	0	0240				
0203	0	3A00				
0204	0	0000				
0205	0	0760				
0206	0	FF00				
0207	0	0240				

DATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68
EC NO.	415490	415490C	419643	420403	420403A

PROG ID 03A1-1
PAGE 21

CORE	DATA OR	*LA- OPER-	*BEL ATION FT	OPERANDS & REMARKS	ID&SEQ# AT RIGHT
ADDR	INSTRUCTION				
0208	0 C039	A280	LO	N280	3A127900
0209	0 1810		SRA	16	3A127910
020A	0 4C18 020F		8SC	L G280, &-	3A127920
020C	0 4400 0F69		8SI	L F000	3A127930
020E	0 306A		OC	/306A	3A127940
020F	0 4400 0FC4	G280	8SI	L F005	3A127950
02E1	0 70F6		MOX	A280	3A127960
				LOOP	3A127970
02E2	0 C030	A281	LO	N281	3A127980
02E3	0 180F		SRA	15	3A127990
02E4	0 F02F		EOR	N282	3A128000
02E5	0 4C18 02EA		8SC	L G281, &-	3A128010
02E7	0 4400 0F69		8SI	L F000	3A128020
02E9	0 3068		DC	/3068	3A128030
02EA	0 4400 0FC4	G281	8SI	L F005	3A128040
02EC	0 70F5		MOX	A281	3A128050
				LOOP	3A128060
02E0	0 C027	A282	LO	N283	3A128070
02EE	0 1801		SRA	1	3A128080
02EF	0 F026		EOR	N284	3A128090
02F0	0 4C18 02F5		8SC	L G282, &-	3A128100
02F2	0 4400 0F69		8SI	L F000	3A128110
02F4	0 306C		OC	/306C	3A128120
02F5	0 4400 0FC4	G282	8SI	L F005	3A128130
02F7	0 70F5		MOX	A282	3A128140
				LOOP	3A128150
02F8	0 C010	A283	LO	N284	3A128160
02F9	0 1801		SRA	1	3A128170
02FA	0 F01C		EOR	N285	3A128180
02FB	0 4C18 0300		8SC	L G283, &-	3A128190
02FD	0 4400 0F69		8SI	L F000	3A128200
02FE	0 3060		OC	/3060	3A128210
0300	0 4400 0FC4	G283	8SI	L F005	3A128220
0302	0 70F5		MOX	A283	3A128230
				LOOP	3A128240
0303	0 C00F	A284	LO	N281	3A128250
0304	0 1801		SRA	1	3A128260
0305	0 1802		SRA	2	3A128270
0306	0 1804		SRA	4	3A128280
0307	0 1808		SRA	8	3A128290
0308	0 F008		EOR	N282	3A128300
0309	0 4C18 030E		8SC	L G284, &-	3A128310
030B	0 4400 0F69		8SI	L F000	3A128320
030D	0 306E		OC	/306E	3A128330
030E	0 4400 0FC4	G284	8SI	L F005	3A128340
0310	0 70F2		MOX	A284	3A128350
0311	0 7006		MOX	A2C0	3A128360
0312	0 FFFF	N280	OC	/FFFF	3A128370
0313	0 8000	N281	OC	/8000	3A128380
0314	0 0001	N282	OC	/0001	3A128390
0315	0 AAAA	N283	OC	/AAAA	3A128400
0316	0 5555	N284	OC	/5555	3A128410
0317	0 2AAA	N285	OC	/2AAA	3A128420
					3A128430
					3A128440
					3A128450
					3A128460
					3A128470
					3A128480
					3A128490
					3A128500
					3A128510
					3A128520

DATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68
EC NO.	415490	415490C	419643	420403	420403A

PROG ID 03A1-1
PAGE 21A

CPU FUNCTION TEST

PART NO. 2191204
PAGE 22

```
031A 0 4C18 031F      8SC L G2C0,G-  BRANCH ON ZERO      3A12858D
031C 0 4400 0F69      8SI L F000    AND OF 0 AND 1 FAILED  3A128590
031E 0 306F           DC   /306F    ERR 10                3A128600
031F 0 4400 0FC4      G2C0 8SI L F005    CK LOCK ON ERROR  3A128610
0321 0 70F6           MOX   A2C0     LDOP                  3A12862D
*****
0322 0 C01F           A2C4 LD   N2C0     LO /00D0          3A12863D
0323 0 E01F           ANO   N2C2     LD /FFFF             3A128640
0324 0 4C18 0329      8SC L G2C4,G-  BRANCH DN ZERO      3A12865D
0326 0 4400 0F69      8SI L F000    AND OF 0 AND 1 FAILED  3A128660
0328 0 3070           DC   /3070    ERR 10                3A128670
0329 0 4400 0FC4      G2C4 8SI L F0D5    CK LOCK ON ERROR  3A128680
0328 0 70F6           MOX   A2C4     LDOP                  3A12869D
*****
032C 0 C016           A2C8 LD   N2C2     LD /FFFF             3A128700
032D 0 E014           ANO   N2C2     AND /0D0D            3A12871D
032E 0 4C18 0333      8SC L G2C8,G-  BRANCH ON ZERO      3A128720
0330 0 4400 0F69      8SI L F000    AND OF 1 AND 0 FAILED  3A128730
0332 0 3071           DC   /3071    ERR 10                3A128740
0333 0 4400 0FC4      G2C8 8SI L F0D5    CK LOCK DN ERRDR   3A128750
0335 0 70F6           MOX   A2C8     LOOP                  3A12876D
*****
0336 0 C00C           A2CC LO   N2C2     LO /FFFF             3A12877D
0337 0 E008           ANO   N2C2     AND /FFFF            3A128780
0338 0 F00A           EOR   N2C2     ZERO WITH /FFFF       3A128790
0339 0 4C18 033E      8SC L G2CC,G-  BRANCH DN ZERO      3A128800
0338 0 4400 0F69      8SI L F000    AND OF 1 AND 1 FAILED  3A128810
0330 0 3072           DC   /3072    ERR 10                3A12882D
033E 0 4400 0FC4      G2CC 8SI L F005    CK LDCK ON ERROR  3A128830
0340 0 70F5           MOX   A2CC     LOOP                  3A128840
0341 0 7002           MOX   A300     EXIT TO NEXT ROUTINE  3A128850
0342 0 0000           N2C0 OC   /0000                                3A128860
0343 0 FFFF           N2C2 DC   /FFFF                                3A128870
*****
```

TEST OF OR FUNCTION

```
*****
CORE  DATA OR  *LA- OPER-
ADDR  INSTRUCTION *BEL ATION FT OPERANDS & REMARKS  IO&SEQ# AT RIGHT
*****
0344 0 C020      A300 LO   N300     LD /0000          3A128900
0345 0 E81F      OR     N300     OR /D00D            3A128910
0346 0 4C18 0348  8SC L G300,G-  BRANCH DN ZERO      3A128920
0348 0 4400 0F69  8SI L F000    DR OF 0 AND 0 FAILED  3A128930
034A 0 3073      OC   /3073    ERR 10                3A128940
0348 0 4400 0FC4  G300 8SI L F005    CK LDCK ON ERROR  3A12895D
0340 0 70F6      MOX   A300     LDOP                  3A128960
*****
034E 0 C016      A302 LO   N300     LO /0000          3A128970
034F 0 E816      OR     N302     OR /FFFF             3A128980
0350 0 F015      EOR   N302     ZERO WITH /FFFF       3A12899D
0351 0 4C18 0356  8SC L G302,G-  BRANCH ON ZERO      3A129000
0353 0 4400 0F69  8SI L F000    OR OF 0 AND 1 FAILED  3A129010
0355 0 3074      OC   /3074    ERR 10                3A129020
0356 0 4400 0FC4  G302 8SI L F005    CHECK LDOP SWITCH  3A129030
0358 0 70F5      MOX   A302     LOOP                  3A129040
*****
0359 0 C00C      A304 LO   N302     LD /FFFF             3A129050
035A 0 E808      OR     N302     DR /FFFF            3A129060
0358 0 F00A      EOR   N302     EOR IN /FFFF          3A129070
035C 0 4C18 0361  8SC L G304,G-  BRANCH DN ZERO      3A129080
035E 0 4400 0F69  8SI L F000    OR OF 1 AND 1 FAILED  3A129090
0360 0 3075      OC   /3075    ERR 10                3A129100
0361 0 4400 0FC4  G304 8SI L F005    CK LOCK ON ERRCR   3A12911Q
0363 0 70F5      MOX   A304     LOOP                  3A12912D
0364 0 7002      MOX   A340     EXIT TO NEXT ROUTINE  3A12913D
0365 0 0000      N300 OC   /0000                                3A129140
*****
```

DATE 02JAN66 01MAY66 15NOV66 15FE868 26AUG68
EC NO. 415490 415490C 419643 420403 420403APROG IO 03A1-1
PAGE 22

CPU FUNCTION TEST

PART NO. 2191204
PAGE 22A

```
0366 0 FFFF      N302 OC   /FFFF                                3A129260
*****
TEST OF RTE 16 OPERATION
*****
CORE  DATA OR  *LA- OPER-
ADDR  INSTRUCTION *BEL ATION FT OPERANDS & REMARKS  IO&SEQ# AT RIGHT
*****
0367 0 CD16      A340 LO   N340     LO /0000          3A129310
0368 0 18DD      RTE   16         PLACE /0000 IN Q REG  3A129320
0369 0 C015      LO    N341     LO /FFFF             3A129330
036A 0 1800      RTE   16         NOW A#/0000 Q#/FFFF  3A129340
0368 0 4C18 037D  8SC L G340,G-  BRANCH ON ZERO      3A129350
0360 0 4400 0F69  8SI L F000    ALL 0 THRU 0 FAILED  3A129360
036F 0 3076      OC   /3076    ERR 10                3A129370
0370 0 4400 0F98  G340 8SI L F00E    CK LOCK ON ERROR  3A129380
0372 0 70F4      MOX   A340     LOOP                  3A129390
0373 0 1800      RTE   16         NOW A#/FFFF Q#/0000  3A129400
0374 0 F00A      EOR   N341     ZERO WITH /FFFF       3A129410
0375 0 4C18 037A  8SC L G342,G-  BRANCH ON ZERO      3A129420
0377 0 4400 0F69  8SI L F000    ALL 1 THRU 0 FAILED  3A129430
0379 0 3077      OC   /3077    ERR 10                3A129440
037A 0 440D 0FC4  G342 8SI L F005    CK LOCK ON ERROR  3A129450
037C 0 70EA      MOX   A340     LOOP                  3A129460
037D 0 7002      MOX   A380     EXIT TO NEXT ROUTINE  3A129470
037E 0 0000      N340 OC   /0000                                3A129480
037F 0 FFFF      N341 OC   /FFFF                                3A129490
*****
TEST OF SRT OPERATION
*****
0380 0 C055      A380 LO   N380     LO /8000          3A129500
0381 0 18A0      SRT   32         NOW A#/FFFF Q#/FFFF  3A129510
0382 0 F054      EOR   N381     EOR IN /FFFF          3A129520
0383 0 4C18 038B  8SC L G380,G-  BRANCH ON ZERO      3A129530
0385 0 4400 0F69  8SI L F000    SRT 32-A REG FAILED  3A129540
0387 0 3078      OC   /3078    ERR 10                3A129550
0388 0 4400 0F98  G380 8SI L F00E    CK LOCK ON ERROR  3A129560
038A 0 70F5      MOX   A380     LOOP                  3A129570
0388 0 1800      RTE   16         NOW A#/FFFF Q#/0000  3A129580
038C 0 F04A      EOR   N381     EOR IN /FFFF          3A129590
0380 0 4C18 0392  8SC L G382,G-  BRANCH ON ZERO      3A129600
038F 0 4400 0F69  8SI L F000    SRT 32-Q REG FAILED  3A129610
0391 0 3079      OC   /3079    ERR 10                3A129620
0392 0 4400 0FC4  G382 8SI L F005    CK LOCK ON ERROR  3A129630
0394 0 70E8      MOX   A380     LOOP                  3A129640
*****
0395 0 C042      A384 LO   N382     LO /4000          3A129650
0396 0 18A0      SRT   32         NOW A#/0000 Q#/0000  3A129660
0397 0 4C18 039C  8SC L G384,G-  BRANCH ON ZERO      3A129670
0399 0 4400 0F69  8SI L F000    SRT 32-A REG FAILED  3A129680
0398 0 307A      OC   /307A    ERR 10                3A129690
039C 0 4400 0FC4  G384 8SI L F005    CK LOCK ON ERROR  3A129700
039E 0 70F6      MOX   A384     LOOP                  3A129710
039F 0 18DD      RTE   16         NOW A#/0000 Q#/0000  3A129720
03A0 0 4C18 03A5  8SC L G386,G-  BRANCH ON ZERO      3A129730
03A2 0 440D 0F69  8SI L F000    SRT 32-Q REG FAILED  3A129740
03A4 0 3078      OC   /3078    ERR 10                3A129750
03A5 0 4400 0FC4  G386 8SI L F005    CK LOCK ON ERROR  3A129760
03A7 0 70E0      MOX   A384     LOOP                  3A129770
*****
03A8 0 C030      A388 LO   N383     LO /5555          3A129780
03A9 0 188F      SRT   15         NOW A#/0000 Q#/0000  3A129790
03AA 0 4C18 03AF  8SC L G388,G-  BRANCH ON ZERO      3A129800
03AC 0 4400 0F69  8SI L F000    SRT 15-A REG FAILED  3A129810
03AE 0 307C      DC   /307C    ERR 10                3A129820
03AF 0 4400 0F98  G388 8SI L F00E    CK LOCK ON ERROR  3A129830
```

DATE 02JAN66 01MAY66 15NOV66 15FE868 26AUG68
EC NO. 415490 415490C 419643 420403 420403APROG IO 03A1-1
PAGE 22A

0381 0 70F6 MOX A388 LOOP 3A129940
0382 0 18D0 RTE 16 NOW A#/AAAA Q#/0000 3A129950
0383 0 F026 EOR N384 ZERO WITH /AAAA 3A129960
0384 0 4C18 0389 8SC L G38A,E- BRANCH ON ZERO 3A129970
0386 0 4400 0F69 8SI L F000 SRT 15-0 REG FAILED 3A129980
0388 0 3070 OC /3070 ERR ID 3A129990
0389 0 4400 0FC4 G38A 8SI L F005 CK LOCK ON ERROR 3A130000
0388 0 70EC MOX A388 LOOP 3A130010
***** 3A130020
***** 3A130030
CORE DATA OR *LA- OPER- 3A130040
ADDR INSTRUCTION *8EL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT 3A130050
***** 3A130060
038C 0 C01C A38C LO N383 LD /5555 3A130070
038D 0 1880 SRT 0 NOW A#/5555 Q#/0000 3A130080
038E 0 1882 SRT 2 NOW A#/1555 Q#/4000 3A130090
038F 0 1884 SRT 4 /0155 /5400 3A130100
03C0 0 1886 SRT 6 /0005 /5550 3A130110
03C1 0 1888 SRT 8 /0000 /0555 3A130120
03C2 0 188A SRT 10 /0000 /0001 3A130130
03C3 0 4C18 03C8 8SC L G38C,E- BRANCH ON ZERO 3A130140
03C5 0 4400 0F69 8SI L F000 SERIES SRT FAILED 3A130150
03C7 0 307E OC /307E ERR ID 3A130160
03C8 0 4400 0F98 G38C 8SI L F00E CK LOCK ON ERROR 3A130170
03CA 0 70F1 MDX A38C LOOP 3A130180
03C8 0 18D0 RTE 16 NOW A#/0001 Q#/0000 3A130190
03CC 0 F00E EOR N385 ZERO WITH /0001 3A130200
03CD 0 4C18 0302 8SC L G38E,E- BRANCH ON ZERO 3A130210
03CF 0 4400 0F69 8SI L F000 SERIES SRT FAILED 3A130220
03D1 0 307F OC /307F ERR ID 3A130230
03D2 0 4400 0FC4 G38E 8SI L F005 CK LOCK ON ERROR 3A130240
03D4 0 70E7 MDX A38C LOOP 3A130250
03D5 0 7006 MDX A3C0 EXIT TO NEXT ROUTINE 3A130260
03D6 0 8000 N380 OC /8000 3A130270
03D7 0 FFFF N381 DC /FFFF 3A130280
03D8 0 4000 N382 DC /4000 3A130290
03D9 0 5555 N383 DC /5555 3A130300
03DA 0 AAAA N384 OC /AAAA 3A130310
03DB 0 0001 N385 OC /0001 3A130320
* 3A130330
* 3A130340
* 3A130350
***** 3A130360
***** 3A130370
03DC 0 C02F A3C0 LO N3C1 LD /AAAA 3A130380
03DD 0 18D0 RTE 16 NOW A#/0000 Q#/AAAA 3A130390
03DE 0 C02C LO N3C0 NOW A#/5555 Q#/AAAA 3A130400
03DF 0 18CF RTE 15 NOW A#/5554 Q#/AAAA 3A130410
03E0 0 F02E EOR N3C4 ZERO WITH /5554 3A130420
03E1 0 4C18 03E6 8SC L G3C0,E- BRANCH ON ZERO 3A130430
03E3 0 4400 0F69 8SI L F000 RTE 15-Q TO A FAILED 3A130440
03E5 0 3080 DC /3080 ERR ID 3A130450
03E6 0 4400 0F98 G3C0 8SI L F00E CK LOCK ON ERROR 3A130460
03E8 0 70F3 MDX A3C0 LOOP 3A130470
03E9 0 18D0 RTE 16 NOW A#/AAA8 Q#/5554 3A130480
03EA 0 F025 EOR N3C5 ZERO WITH /AAA8 3A130490
03EB 0 4C18 03F0 8SC L G3C2,E- BRANCH ON ZERO 3A130500
03ED 0 4400 0F69 8SI L F000 RTE 15-A TO Q FAILED 3A130510
03EF 0 3081 DC /3081 ERR ID 3A130520
03F0 0 4400 0FC4 G3C2 8SI L F005 CK LOCK ON ERROR 3A130530
03F2 0 70E9 MDX A3C0 LOOP 3A130540
***** 3A130550
***** 3A130560
CORE DATA OR *LA- OPER- 3A130570
ADDR INSTRUCTION *8EL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT 3A130580
***** 3A130590
03F3 0 C01A A3C4 LD N3C3 LD /8000 3A130600
03F4 0 1800 RTE 16 NOW A#/XXXX Q#/8000 3A130610
03F5 0 C017 LD N3C2 LD /0000

03F6 0 18C0 RTE 0 NOW A#/0000 Q#/8000 3A130620
03F7 0 180F RTE 31 3A130630
03F8 0 F018 EOR N3C6 ZERO WITH /0001 3A130640
03F9 0 4C18 03FE 8SC L G3C4,E- BRANCH ON ZERO 3A130650
03F8 0 4400 0F69 8SI L F000 SERIES RTE FAILED 3A130660
03FD 0 3082 OC /3082 ERR ID 3A130670
03FE 0 4400 0F98 G3C4 8SI L F00E CK LOCK ON ERROR 3A130680
0400 0 70F2 MDX A3C4 LOOP 3A130690
0401 0 1800 RTE 16 NOW A-/0000 Q-/0000 3A130700
0402 0 4C18 0407 8SC L G3C6,E- BRANCH ON ZERO 3A130710
0404 0 4400 0F69 8SI L F000 SERIES RTE FAILED 3A130720
0406 0 3083 DC /3083 ERR ID 3A130730
0407 0 4400 0FC4 G3C6 8SI L F005 CK LOCK ON ERROR 3A130740
0409 0 70E9 MDX A3C4 LOOP 3A130750
040A 0 7007 MDX A400 EXIT TO NEXT ROUTINE 3A130760
0408 0 5555 N3C0 OC /5555 3A130770
040C 0 AAAA N3C1 DC /AAAA 3A130780
040D 0 0000 N3C2 OC /0000 3A130790
040E 0 8000 N3C3 OC /8000 3A130800
040F 0 5554 N3C4 DC /5554 3A130810
0410 0 AAA8 N3C5 DC /AAA8 3A130820
0411 0 0001 N3C6 OC /0001 3A130830
* 3A130840
* 3A130850
* 3A130860
***** 3A130870
***** 3A130880
0412 0 C400 0486 A400 LO L N400 LO /FFFF 3A130890
0414 0 18D0 RTE 16 NOW A#/XXXX Q#/FFFF 3A130900
0415 0 C400 0486 LO L N400 LO /FFFF 3A130910
0417 0 1010 SLA 16 NOW A#/0000 Q#/FFFF 3A130920
0418 0 4C02 0410 8SC L G404,C BR ON CARRY 3A130930
041A 0 4400 0F69 8SI L F000 SLA 15-CARRY FAILED 3A130940
041C 0 3085 DC /3085 ERR ID 3A130950
041D 0 4400 0F98 G404 8SI L F00E CK LOCK ON ERROR 3A130960
041F 0 70F2 MDX A400 LOOP 3A130970
0420 0 4C18 0425 8SC L G400,E- BRANCH ON ZERO 3A130980
0422 0 4400 0F69 8SI L F000 SLA 16-A REG FAILED 3A130990
0424 0 3084 OC /3084 ERR ID 3A131000
0425 0 4400 0F98 G400 8SI L F00E CK LOCK ON ERROR 3A131010
0427 0 70EA MDX A400 LOOP 3A131020
0428 0 18D0 RTE 16 NOW A#/FFFF Q#/0000 3A131030
0429 0 F400 0486 EOR L N400 ZERO WITH /FFFF 3A131040
0428 0 4C18 0430 8SC L G406,E- BRANCH ON ZERO 3A131050
0420 0 4400 0F69 8SI L F000 SLA 16-AFFECTED 0 REG 3A131060
042F 0 3086 OC /3086 ERR ID 3A131070
0430 0 4400 0FC4 G406 8SI L F005 CK LOCK ON ERROR 3A131080
0432 0 70DF MDX A400 LOOP 3A131090
***** 3A131100
***** 3A131110
CORE DATA OR *LA- OPER- 3A131120
ADDR INSTRUCTION *8EL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT 3A131130
***** 3A131140
0433 0 C400 0488 A408 LO L N405 LD /0000 3A131150
0435 0 18D0 RTE 16 NOW A#/XXXX Q#/0000 3A131160
0436 0 C400 048C LO L N406 /FFFF /0000 3A131170
0438 0 1010 SLA 16 /0000 /0000 3A131180
0439 0 4C02 043C 8SC L G407,C BR ON CARRY 3A131190
0438 0 7003 MDX G40C 3A131200
043C 0 4400 0F69 G407 8SI L F000 SLA 16- CARRY FAILED 3A131210
043E 0 3088 OC /3088 ERR ID 3A131220
043F 0 4400 0F98 G40C 8SI L F00E CK LOCK ON ERROR 3A131230
0441 0 70F1 MDX A408 LOOP 3A131240
0442 0 4C18 0447 8SC L G408,E- BRANCH ON ZERO 3A131250
0444 0 4400 0F69 8SI L F000 SLA 16-A REG FAILED 3A131260
0446 0 3087 OC /3087 ERR ID 3A131270
0447 0 4400 0F98 G408 8SI L F00E CK LOCK ON ERROR 3A131280
0449 0 70E9 MDX A408 LOOP 3A131290
044A 0 18D0 RTE 16 NOW A#/0000 Q#/0000

CPU FUNCTION TEST

```
044B 0 4C18 0450      BSC L G40E,C-  BRANCH ON ZERO      3A131300
0440 0 4400 0F69      BSI L F000      SLA 16-AFFECTED Q REG  3A131310
044F 0 3089           OC /3089      ERR IO              3A131320
0450 0 4400 0FC4      G40E BSI L F005      CK LOCK ON ERROR  3A131330
0452 0 70E0           MOX A40B      LOOP                3A131340
*****
0453 0 C067           B400 LO N405      LO /0000          3A131350
0454 0 1800           RTE 16      NOW A#/XXXX Q#/0000  3A131360
0455 0 C063           LO N403      LO /AAAA          3A131370
0456 0 1001           SLA 1      NOW A#/5554 Q#/0000  3A131380
0457 0 4C02 045C      BSC L H402,C  BRANCH ON CARRY  3A131390
0459 0 4400 0F69      BSI L F000      SLA 1-CARRY FAILED 3A131400
045B 0 308B           OC /308B      ERR IO              3A131410
045C 0 4400 0F98      H402 BSI L F00E      CK LOCK ON ERROR  3A131420
045E 0 70F4           MOX B400      LOOP                3A131430
045F 0 F05A           EOR N404      ZERO WITH /5554  3A131440
0460 0 4C18 0465      BSC L H400,C- BRANCH ON ZERO  3A131450
0462 0 4400 0F69      BSI L F000      SLA 1-A REG FAILED 3A131460
0464 0 308A           OC /308A      ERR IO              3A131470
0465 0 4400 0F98      H400 BSI L F00E      CK LOCK ON ERROR  3A131480
0467 0 70E8           MOX B400      LOOP                3A131490
0468 0 1800           RTE 16      NOW A#/0000 0#/5554 3A131500
0469 0 4C18 046E      BSC L H404,C- BRANCH ON ZERO  3A131510
046B 0 4400 0F69      BSI L F000      SLA 1-AFFECTED Q REG 3A131520
0460 0 308C           OC /308C      ERR IO              3A131530
046E 0 4400 0FC4      H404 BSI L F005      CK LOCK ON ERROR  3A131540
0470 0 70E2           MOX B400      LOOP                3A131550
*****
0471 0 C049           B406 LO N405      LO /0000          3A131560
0472 0 1800           RTE 16      NOW A#/XXXX 0#/0000 3A131570
0473 0 C044           LO N402      LO /5555          3A131580
0474 0 1001           SLA 1      NOW A#/AAAA Q#/0000 3A131590
0475 0 4C02 0478      BSC L H407,C  BR ON CARRY       3A131600
0477 0 7003           MOX H405      LOOP                3A131610
0478 0 4400 0F69      H407 BSI L F000      SLA 1-CARRY FAILED 3A131620
047A 0 308E           OC /308E      ERR IO              3A131630
047B 0 4400 0F98      H405 BSI L F00E      CK LOCK ON ERROR  3A131640
0470 0 70F3           MOX B406      LOOP                3A131650
047E 0 F03A           EOR N403      ZERO WITH /AAAA  3A131660
047F 0 4C18 0484      BSC L H406,C- BRANCH ON ZERO  3A131670
0481 0 4400 0F69      BSI L F000      SLA 1-A REG FAILED 3A131680
0483 0 3080           OC /3080      ERR IO              3A131690
0484 0 4400 0F98      H406 BSI L F00E      CK LOCK ON ERROR  3A131700
0486 0 70EA           MOX B406      LOOP                3A131710
0487 0 1800           RTE 16      NOW A#/0000 Q#/AAAA 3A131720
0488 0 4C18 0480      BSC L H40B,C- BRANCH ON ZERO  3A131730
048A 0 4400 0F69      BSI L F000      SLA 1-AFFECTED Q REG 3A131740
048C 0 308F           OC /308F      ERR IO              3A131750
0480 0 4400 0FC4      H40B BSI L F005      CK LOCK ON ERROR  3A131760
048F 0 70E1           MOX B406      LOOP                3A131770
*****
***** CORE DATA OR *LA- OPER-
A00R INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT *****
*****
0490 0 C02A           B40A LO N405      LO /0000          3A131780
0491 0 1800           RTE 16      NOW A#/XXXX Q#/0000 3A131790
0492 0 C024           LO N401      LD /0001          3A131800
0493 0 6101           LOX 1 1      LD /0001          3A131810
0494 0 6204           LOX 2 4      LD /0001          3A131820
0495 0 6303           LOX 3 3      LD /0001          3A131830
0496 0 1000           SLA 0      NOW A#/0001 Q#/0000 3A131840
0497 0 1100           SLA 1 0      /0002 /0000      3A131850
0498 0 1002           SLA 2      /0008 /0000      3A131860
0499 0 1200           SLA 2 0      /0080 /0000      3A131870
049A 0 1006           SLA 6      /2000 /0000      3A131880
049B 0 1300           SLA 3 0      /0000 /0000      3A131890
049C 0 4C02 04A1      BSC L H400,C  BRANCH ON CARRY  3A131900
3A131910
3A131920
3A131930
3A131940
3A131950
3A131960
3A131970
```

CPU FUNCTION TEST

```
049E 0 4400 0F69      BSI L F000      COMB SLA-CARRY FAILED 3A131980
04A0 0 3091           OC /3091      ERR IO              3A131990
04A1 0 4400 0F98      H400 BSI L F00E      CK LOCK ON ERROR  3A132000
04A3 0 70EC           MOX B40A      LOOP                3A132010
04A4 0 4C18 04A9      BSC L H40A,C- BRANCH ON ZERO  3A132020
04A6 0 4400 0F69      BSI L F000      COMB SLA-A REG FAILED 3A132030
04A8 0 3090           OC /3090      ERR IO              3A132040
04A9 0 4400 0F98      H40A BSI L F00E      CK LOCK ON ERROR  3A132050
04AB 0 70E4           MOX B40A      LOOP                3A132060
04AC 0 1800           RTE 16      EXIT TO NEXT ROUTINE 3A132070
04AD 0 4C18 04B2      BSC L H40E,C- BRANCH ON ZERO  3A132080
04AF 0 4400 0F69      BSI L F000      COMB SLA-AFFECTED Q 3A132090
04B1 0 3092           OC /3092      ERR IO              3A132100
04B2 0 4400 0FC4      H40E BSI L F005      CK LOCK ON ERROR  3A132110
04B4 0 7008           MOX B40A      LOOP                3A132120
04B5 0 7007           MOX A440      EXIT TO NEXT ROUTINE 3A132130
04B6 0 FFFF           N400 OC /FFFF      3A132140
04B7 0 0001           N401 OC /0001      3A132150
04B8 0 5555           N402 OC /5555      3A132160
04B9 0 AAAA           N403 OC /AAAA      3A132170
04BA 0 5554           N404 OC /5554      3A132180
04BB 0 0000           N405 DC /0000      3A132190
04BC 0 FFFE           N406 DC /FFFE      3A132200
*
* TEST OF SLT OPERATION
*
*****
04BD 0 C07E           A440 LO N440      LO /0001          3A132210
04BE 0 1800           RTE 16      NOW A#/XXXX Q#/0001 3A132220
04BF 0 C070           LO N441      LO /0000          3A132230
04C0 0 10A0           SLT 32      /0000 Q#/0000  3A132240
04C1 0 4C02 04C6      BSC L G442,C  BRANCH ON CARRY  3A132250
04C3 0 4400 0F69      BSI L F000      SLT 32-CARRY FAILED 3A132260
04C5 0 3094           OC /3094      ERR IO              3A132270
04C6 0 4400 0F98      G442 BSI L F00E      CK LOCK ON ERROR  3A132280
04C8 0 70F4           MOX A440      LOOP                3A132290
04C9 0 4C18 04CE      BSC L G440,C- BRANCH ON ZERO  3A132300
04CB 0 4400 0F69      BSI L F000      SLT 32-A REG FAILED 3A132310
04CD 0 3093           OC /3093      ERR IO              3A132320
04CE 0 4400 0F98      G440 BSI L F00E      CK LOCK ON ERROR  3A132330
04D0 0 70EC           MOX A440      LOOP                3A132340
04D1 0 1800           RTE 16      NOW A#/0000 Q#/0000 3A132350
04D2 0 4C18 04D7      BSC L G443,C- BRANCH ON ZERO  3A132360
04D4 0 4400 0F69      BSI L F000      SLT 32-0 REG FAILED 3A132370
04D6 0 3095           OC /3095      ERR IO              3A132380
04D7 0 4400 0FC4      G443 BSI L F005      CK LOCK ON ERROR  3A132390
04D9 0 70E3           MOX A440      LOOP                3A132400
*****
***** CORE DATA OR *LA- OPER-
A00R INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT *****
*****
04DA 0 C063           A444 LO N442      LD /FFFF          3A132410
04DB 0 1800           RTE 16      NOW A#/XXXX Q#/FFFF 3A132420
04DC 0 C060           LO N441      LO /0000          3A132430
04DD 0 1090           SLT 16      NOW A#/FFFF Q#/0000 3A132440
04DE 0 4C02 04E1      BSC L G446,C  BR ON CARRY       3A132450
04E0 0 7003           MOX G447      LOOP                3A132460
04E1 0 4400 0F69      G446 BSI L F000      SLT 16-CARRY FAILED 3A132470
04E3 0 3097           OC /3097      ERR IO              3A132480
04E4 0 4400 0F98      G447 BSI L F00E      CK LOCK ON ERROR  3A132490
04E6 0 70F3           MOX A444      LOOP                3A132500
04E7 0 F056           EOR N442      ZERO WITH /FFFF  3A132510
04E8 0 4C18 04E0      BSC L G444,C- BRANCH ON ZERO  3A132520
04EA 0 4400 0F69      BSI L F000      SLT 16-A REG FAILED 3A132530
04EC 0 3096           OC /3096      ERR IO              3A132540
04ED 0 4400 0F98      G444 BSI L F00E      CK LOCK ON ERROR  3A132550
04EF 0 70EA           MOX A444      LOOP                3A132560
3A132570
3A132580
3A132590
3A132600
3A132610
3A132620
3A132630
3A132640
3A132650
```

CPU FUNCTION TEST

```
04F0 0 18D0      RTE      16      NOW A#/0000 Q#/C000      3A132660
04F1 0 4C18 04F6  BSC L   G448,&-  BRANCH DN ZERO      3A132670
04F3 0 4400 0F69  BSI L   F000      SLT 16-Q REG FAILED  3A132680
04F5 0 3098      DC      /3098      ERR IO      3A132690
04F6 0 4400 0FC4  G448 BSI L   F005      CK LOCK DN ERROR  3A132700
04F8 0 70E1      MDX      A444      LOOP      3A132710
*****
04F9 0 C045      A44A LD      N443      LD /5555      3A132720
04FA 0 1800      RTE      16      NOW A#/XXXX Q#/5555      3A132730
04FB 0 C041      LD      N441      /0000 /5555      3A132740
04FC 0 10BF      SLT      15      /2AAA /8000      3A132750
04FD 0 4C02 0500  BSC L   G44C,C  BR DN CARRY      3A132760
04FF 0 7003      MDX      G44D      3A132770
0500 0 4400 0F69  G44C BSI L   F000      SLT 15-CARRY FAILED  3A132780
0502 0 309A      OC      /309A      ERR IO      3A132790
0503 0 4400 0F9B  G44D BSI L   F00E      CK LOCK DN ERROR  3A132800
0505 0 70F3      MDX      A44A      LOOP      3A132810
0506 0 F039      EDR      N444      ZERO WITH /2AAA      3A132820
0507 0 4C18 050C  BSC L   G44A,&-  BRANCH DN ZERO      3A132830
0509 0 4400 0F69  BSI L   F000      SLT 15-A REG FAILED  3A132840
050B 0 3099      DC      /3099      ERR IO      3A132850
050C 0 4400 0F9B  G44A BSI L   F00E      CK LOCK DN ERROR  3A132860
050E 0 70EA      MDX      A44A      LOOP      3A132870
050F 0 18D0      RTE      16      NOW A#/8000 Q#/0000      3A132880
0510 0 F030      EDR      N445      ZERD WITH /8000      3A132890
0511 0 4C18 0516  BSC L   G44E,&-  BRANCH DN ZERO      3A132900
0513 0 4400 0F69  BSI L   F000      SLT 15-Q REG FAILED  3A132910
0515 0 3098      OC      /3098      ERR IO      3A132920
0516 0 4400 0FC4  G44E BSI L   F005      CK LOCK DN ERROR  3A132930
0518 0 70E0      MDX      A44A      LDOP      3A132940
*****
*****
COKE      DATA OR      *LA- OPER-
ADDR      INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT
*****
0519 0 C022      B440 LD      N440      LD /0001      3A132950
051A 0 18D0      RTE      16      NDW A#/XXXX Q#/0001      3A132960
051B 0 C021      LD      N441      LD /0000      3A132970
051C 0 1080      SLT      0      NDW A#/0000 Q#/0001      3A132980
051D 0 1081      SLT      1      /0000 /0002      3A132990
051E 0 1085      SLT      5      /0000 /0040      3A133000
051F 0 1087      SLT      7      /0000 /2000      3A133010
0520 0 1089      SLT      9      /0040 /0000      3A133020
0521 0 108A      SLT      10     /0000 /0000      3A133030
0522 0 4C02 0527  BSC L   H443,C  BR DN CARRY      3A133040
0524 0 4400 0F69  BSI L   F000      COMB SLT-CARRY FAILED  3A133050
0526 0 309D      OC      /309D      ERR IO      3A133060
0527 0 4400 0F9B  H443 BSI L   F00E      CK LOCK DN ERROR  3A133070
0529 0 70EF      MDX      B440      LOOP      3A133080
052A 0 4C18 052F  BSC L   H440,&-  BRANCH DN ZERO      3A133090
052C 0 4400 0F69  BSI L   F000      COMB SLT-A REG FAILE  3A133100
052E 0 309C      DC      /309C      ERR IO      3A133110
052F 0 4400 0F9B  H440 BSI L   F00E      CK LOCK DN ERROR  3A133120
0531 0 70E7      MDX      B440      LOOP      3A133130
0532 0 18D0      RTE      16      NOW A#/0000 Q#/0000      3A133140
0533 0 4C18 0538  BSC L   H444,&-  BRANCH DN ZERO      3A133150
0535 0 4400 0F69  BSI L   F000      COMB SLT-Q REG FAILE  3A133160
0537 0 309E      DC      /309E      ERR IO      3A133170
0538 0 4400 0FC4  H444 BSI L   F005      CK LOCK DN ERROR  3A133180
053A 0 70DE      MDX      B440      LOOP      3A133190
053B 0 7006      MDX      A480      EXIT TO NEXT ROUTINE  3A133200
053C 0 0001      N440 DC      /0001      3A133210
0530 0 0000      N441 OC      /0000      3A133220
053E 0 FFFF      N442 OC      /FFFF      3A133230
053F 0 5555      N443 DC      /5555      3A133240
0540 0 2AAA      N444 OC      /2AAA      3A133250
0541 0 8000      N445 OC      /8000      3A133260
*
```

CPU FUNCTION TEST

```
*      TEST OF STD OPERATION      3A133340
*      3A133350
*****
0542 0 C019      A480 LD      N480      LD /0000      3A133360
0543 0 001A      STO      N482      STO /0000      3A133370
0544 0 C018      LD      N481      LD /FFFF      3A133380
0545 0 C018      LO      N482      LD /0000      3A133390
0546 0 4C18 054B  BSC L   G480,&-  BRANCH DN ZERO      3A133400
0548 0 4400 0F69  BSI L   F000      STO ZEROS FAILED      3A133410
054A 0 309F      DC      /309F      ERR IO      3A133420
054B 0 4400 0FC4  G480 BSI L   F005      CK LOCK DN ERROR  3A133430
0540 0 70F4      MDX      A480      LOOP      3A133440
*****
054E 0 C00E      A482 LD      N481      LO /FFFF      3A133450
054F 0 D00E      STO      N482      3A133460
0550 0 C00B      LO      N480      LO /0000      3A133470
0551 0 C00C      LO      N482      LD /FFFF      3A133480
0552 0 F00A      EDR      N481      ZERO WITH /FFFF      3A133490
0553 0 4C18 055B  BSC L   G482,&-  BRANCH DN ZERO      3A133500
0555 0 4400 0F69  BSI L   F000      STO ONES FAILED      3A133510
0557 0 30A0      OC      /30A0      ERR IO      3A133520
0558 0 4400 0FC4  G482 BSI L   F005      CK LOCK DN ERROR  3A133530
055A 0 70F3      MDX      A482      LDOP      3A133540
055B 0 7003      MDX      A4C0      EXIT TO NEXT ROUTINE  3A133550
055C 0 0000      N480 OC      /0000      3A133560
055D 0 FFFF      N481 OC      /FFFF      3A133570
055E 0 FFFF      N482 OC      /FFFF      3A133580
*      3A133590
*      3A133600
*      3A133610
*      3A133620
*      3A133630
*      3A133640
*****
CORE      DATA OR      *LA- OPER-
ADDR      INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT
*****
055F 0 2003      A4C0 LOS      3      3A133650
0560 0 2000      LOS      0      SET C AND OF OFF      3A133660
0561 0 2850      STS      N4C0      3A133670
0562 0 C05C      LD      N4C0      3A133680
0563 0 4C18 056B  BSC L   G4C3,&-  3A133690
0565 0 4400 0F69  BSI L   F000      STS FAILED TO STORE  3A133700
0567 0 30A1      DC      /30A1      ERR IO      3A133710
0568 0 4400 0FC4  G4C0 BSI L   F005      CK LOCK DN ERROR  3A133720
056A 0 70F4      MDX      A4C0      LOOP      3A133730
*****
056B 0 C0FF      A4C2 LD      A4C2      3A133740
056C 0 2003      LOS      3      3A133750
056D 0 2851      STS      N4C0      3A133760
056E 0 F0FC      EDR      A4C2      3A133770
056F 0 4C18 0574  BSC L   H4C3,&-  BRANCH DN ZERO      3A133780
0571 0 4400 0F69  BSI L   F000      ACC GONE AFT LOS-STs  3A133790
0573 0 30A3      DC      /30A3      ERR IO      3A133800
0574 0 4C02 0577  H4C3 BSC L   H4C2,C  BR IF CARRY IS NO      3A133810
0576 0 7003      MDX      G4C2      3A133820
0577 0 4400 0F69  H4C2 BSI L   F000      STS NOT CLEAR CARRY  3A133830
0579 0 30A2      DC      /30A2      ERR IO      3A133840
057A 0 4400 0F9B  G4C2 BSI L   F00E      CK LOCK DN ERROR  3A133850
057C 0 70EE      MDX      A4C2      LOOP      3A133860
057D 0 4C01 0580  BSC L   H4C4,0  BR IF CARRY IS ON      3A133870
057F 0 7003      MDX      G4C4      3A133880
0580 0 4400 0F69  H4C4 BSI L   F000      STS NOT CLEAR OVERFLW  3A133890
0582 0 30A4      OC      /30A4      ERR IO      3A133900
0583 0 4400 0F9B  G4C4 BSI L   F00E      CK LOCK DN ERROR  3A133910
0585 0 70E5      MDX      A4C2      LOOP      3A133920
0586 0 C03B      LO      N4C0      3A133930
0587 0 F03B      EDR      N4C1      3A133940
0588 0 4C18 058D  BSC L   G4C6,&-  BRANCH DN ZERO      3A133950
058A 0 4400 0F69  BSI L   F000      STS FAILED TO STORE  3A133960
```


CPU FUNCTION TEST

PAGE 26

```
058C 0 30A5          DC      /30A5      ERR ID      3A13402D
058D 0 4400 OFC4     G4C6 BSI L F005      CK LOCK ON ERROR 3A13403D
058F 0 70D8          MDX      A4C2      LOOP          3A134040
*****
0590 0 2002          A4C8 LDS      2          SET C ON OF OFF 3A13405D
0591 0 2002          LDS      2          SET C ON OF OFF 3A13406D
0592 0 282C          STS      N4C0      SET /0002 IN N4C0 3A13407D
0593 0 282D          STS      N4C2      SET /0000 IN N4C2 3A13408D
0594 0 C02A          LO       N4C0      LD /0002          3A13409D
0595 0 F02C          EOR      N4C3      ZERO WITH /0002 3A13410D
0596 0 4C18 0598     BSC L G4C8,&-      BRANCH ON ZERO 3A13411D
0598 0 4400 DF69     BSI L F000      STS FAILED TO STORE 3A13412D
059A 0 30A6          DC      /30A6      ERR ID          3A13413D
059B 0 4400 OF98     G4C8 BSI L F00E      CK LOCK ON ERROR 3A13414D
059D 0 70F2          MDX      A4C8      LOOP          3A13415D
059E 0 C022          LD       N4C2      LD /0002          3A13416D
059F 0 4C1B 05A4     BSC L G4CA,&-      BRANCH ON ZERO 3A13417D
05A1 0 4400 OF69     BSI L F000      STS NOT CLEAR CARRY 3A13418D
05A3 0 30A7          DC      /30A7      ERR ID          3A13419D
05A4 0 4400 OFC4     G4CA BSI L F005      CK LOCK ON ERROR 3A13420D
05A6 0 70E9          MDX      A4C8      LOOP          3A13421D
*****
05A7 0 2003          A4CC LDS      3          SET C-OFF OF - ON 3A13422D
05A8 0 2001          LDS      1          SET C-OFF OF - ON 3A13423D
05A9 0 2815          STS      N4C0      SET /0001 IN N4C0 3A13424D
05AA 0 2816          STS      N4C2      SET /0000 IN N4C2 3A13425D
05AB 0 C013          LO       N4C0      LD /0001          3A13426D
05AC 0 F016          EOR      N4C4      ZERO WITH /0001 3A13427D
05AD 0 4C1B 0582     BSC L G4CC,&-      BRANCH ON ZERO 3A13428D
05AF 0 4400 OF69     BSI L F000      STS FAILED TO STORE 3A13429D
05B1 0 30A8          DC      /30A8      ERR ID          3A13430D
05B2 0 4400 OF98     G4CC BSI L F00E      CK LOCK ON ERROR 3A13431D
05B4 0 70F2          MDX      A4CC      LOOP          3A13432D
05B5 0 C0D8          LO       N4C2      LD STATUS STORED 3A13433D
05B6 0 4C18 058B     BSC L G4C0,&-      BRANCH ON ZERO 3A13434D
05B8 0 4400 OF69     BSI L F000      STS NOT CLEAR OVERFL 3A13435D
05BA 0 30A9          DC      /30A9      ERR ID          3A13436D
05BB 0 4400 OFC4     G4CD BSI L F005      CK LOCK ON ERROR 3A13437D
05BD 0 70E9          MDX      A4CC      LOOP          3A13438D
05BE 0 7005          MDX      A500      EXIT TO NEXT ROUTINE 3A13439D
05BF 0 DDD3          N4C0 DC      /D003          3A13440D
05C0 0 0003          N4C1 DC      /0003          3A13441D
05C1 0 000D          N4C2 -DC     /0000          3A13442D
05C2 0 0002          N4C3 DC      /0002          3A13443D
05C3 0 DDD1          N4C4 DC      /0001          3A13444D
*****
*                                TEST OF BSC OPERATION                                *
*****
CURE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
05C4 0 2003          A500 LDS      3          SET C AND OF ON 3A13445D
05C5 0 C40D 0658     LD L N500      LD /8001          3A13446D
05C7 0 482F          BSC      0&E2C      SK IF OF OFF, PLUS, EVEN, 3A13447D
*                                * ZERO OR CARRY OFF.                                *
05C8 0 7003          MDX      G500          3A13448D
05C9 0 4400 OF69     BSI L F000      BSC SKPD-SHOULD NOT 3A13449D
05CB 0 30AA          DC      /30AA      ERR ID          3A13450D
05CC 0 4400 OFC4     G500 BSI L F005      CK LOCK ON ERROR 3A13451D
05CE 0 70F5          MDX      A500      LOOP          3A13452D
*****
05CF 0 2003          A502 LDS      3          SET C & OF ON 3A13453D
05D0 0 C400 0659     LD L N501      LD /0000          3A13454D
05D2 0 481B          BSC      -0C&      SK IF MINUS, OF OFF, CARRY 3A13455D
*                                *OFF OR PLUS                                    *
05D3 0 7003          MDX      G502          3A13456D
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PROG ID 03A1-1
PAGE 26

CPU FUNCTION TEST

PAGE 26A

```
05D4 0 4400 OF69     BSI L F000      BSC SKPD-SHOULD NOT 3A134700
05D6 0 30AB          DC      /30AB      ERR ID          3A134710
05D7 0 4400 OFC4     G502 BSI L F005      CK LOCK ON ERROR 3A134720
05D9 0 70F5          MDX      A502      LOOP          3A134730
*****
05DA 0 2003          A504 LDS      3          SET C AND OF ON 3A134740
05DB 0 C07E          LD       N502      LD /8000          3A134750
05DC 0 2809          STS      N507      SET /0003 IN N507 3A134760
05DD 0 4815          BSC      0-E      SK IF OF OFF,MUNIS OR EVEN 3A134770
05DE 0 7001          MDX      G504          3A134780
05DF 0 7003          MDX      G505          3A134790
05E0 0 4400 OF69     G504 BSI L F000      BSC FAILED TO SKIP 3A134800
05E2 0 30AC          DC      /30AC      ERR ID          3A134810
05E3 0 4400 OF98     G505 BSI L F00E      CK LOCK ON ERROR 3A134820
05E5 0 70F4          MDX      A504      LOOP          3A134830
05E6 0 2000          N5D7 LDS      *-      3A134840
05E7 0 4801          BSC      0          SKIP IF OVERFLOW IS OFF 3A134850
05E8 0 4801          BSC      0          3A134860
05E9 0 7001          MDX      G506          3A134870
05EA 0 7003          MDX      G507          3A134880
05EB 0 4400 OF69     G506 BSI L F000      BSC NOT CLEAR OVERFLW 3A134890
05ED 0 30AD          DC      /30AD      ERR ID          3A134900
05EE 0 4400 OFC4     G507 BSI L F005      CK LOCK ON ERROR 3A134910
05F0 0 70E9          MDX      A504      LOOP          3A134920
*****
05F1 0 2000          A508 LDS      0          SET C AND OF OFF 3A134930
05F2 0 C068          LD       N5D3      LD /0001          3A134940
05F3 0 482A          BSC      C&Z      SK IF CARRY OFF, PLUS 3A134950
*                                * OR ZERO                                        3A134960
05F4 0 70D1          MDX      G508          3A134970
05F5 0 7003          MDX      H50B          3A134980
05F6 0 4400 OF69     G508 BSI L F000      BSC FAILED TO SKIP 3A134990
05F8 0 30AE          DC      /30AE      ERR ID          3A135000
05F9 0 4400 OFC4     H50B BSI L F005      CK LOCK ON ERROR 3A135010
05FB 0 70F5          MDX      A508      LOOP          3A135020
*****
05FC 0 2003          A50A LDS      3          SET C AND OF ON 3A135030
05FD 0 C05A          LD       N500      LD /8001          3A135040
05FE 0 4C0F 060F     BSC L G50A,&OCE BR ON NOT PLUS, OF ON, 3A135050
*                                * CARRY ON OR NOT EVEN                        3A135060
0600 0 7001          MDX      H50A          3A135070
0601 0 7007          MDX      J50A          3A135080
0602 0 4400 DF69     H5DA BSI L F00D      BSC FELL THRU 3A135090
0604 0 30AF          DC      /30AF      ERR ID          3A135100
0605 0 4400 OF98     BSI L F00E      CK LOCK ON ERROR 3A135110
0607 0 70F4          MDX      A50A      LOOP          3A135120
0608 0 7006          MDX      G50A          3A135130
0609 0 4400 DF69     J50A BSI L F000      BSC SKPD-SHOULD BRNCH 3A135140
060B 0 30B0          DC      /30B0      ERR ID          3A135150
060C 0 4400 OF98     BSI L F00E      CK LOCK ON ERROR 3A135160
060E 0 70ED          MDX      A50A      LOOP          3A135170
060F 0 F048          G5DA EOR      N500      ZERO WITH /8001 3A135180
0610 0 4820          BSC      Z          SK ON ZERO      3A135190
0611 0 7001          MDX      H50B          3A135200
0612 0 7003          MDX      K50B          3A135210
0613 0 4400 OF69     H50B BSI L F000      ACC DISTROYED AFTER BSC 3A135220
0615 0 3170          OC      /3170      ERR ID          3A135230
0616 0 4400 OFC4     K50B BSI L F005      CK LOCK ON ERROR 3A135240
0618 0 7000          MDX      A50C      EXIT TO NEXT ROUTINE 3A135250
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
0619 0 2003          A50C LDS      3          SET C & OF ON 3A135260
061A 0 C041          LD       N504      LD /0004          3A135270
061B 0 4C30 061F     BSC L G50C,-Z      BR NOT MINUS OR NOT ZERO 3A135280
061D 0 70D2          MDX      H50C          3A135290
*****
061E 0 70D2          MDX      H50C          3A135300
061F 0 70D2          MDX      H50C          3A135310
0620 0 70D2          MDX      H50C          3A135320
0621 0 70D2          MDX      H50C          3A135330
0622 0 70D2          MDX      H50C          3A135340
0623 0 70D2          MDX      H50C          3A135350
0624 0 70D2          MDX      H50C          3A135360
0625 0 70D2          MDX      H50C          3A135370
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403A

PROG ID 03A1-1
PAGE 26A

CPU FUNCTION TEST

```
061E 0 7008      MOX      J50C      3A135380
061F 0 700A      G50C MOX      K50C      3A135390
0620 0 4400 OF69 H50C BSI L F000      3A135400
0622 0 30B1      OC /30B1      3A135410
0623 0 4400 OFC4 BSI L F005      3A135420
0625 0 70F3      MOX      A50C      3A135430
0626 0 7006      MDX      A50E      3A135440
0627 0 4400 OF69 J50C BSI L F000      3A135450
0629 0 30B2      OC /30B2      3A135460
062A 0 4400 OFC4 K50C BSI L F005      3A135470
062C 0 70EC      MDX      A50C      3A135480
062D 0 2000      A50E LDS 0          3A135490
*****
062E 0 2003      LOS      3          3A135500
062F 0 C02B      LD N500      3A135510
0630 0 4C3F 0634 BSC L G50E,&EOCZ- BR ON NOT PLUS, NOT EVEN, 3A135520
*                *OF, CARRY, NOT ZERO OR 3A135530
*                *NOT MINUS 3A135540
0632 0 7008      MOX      H50E      3A135550
0633 0 7007      MOX      J50E      3A135560
0634 0 4400 OF69 G50E BSI L F000      3A135570
0636 0 30B3      OC /30B3      3A135580
0637 0 4400 OFC4 BSI L F005      3A135590
0639 0 70F3      MOX      A50E      3A135600
063A 0 7006      MDX      B500      3A135610
063B 0 4400 OF69 J50E BSI L F000      3A135620
063D 0 30B4      OC /30B4      3A135630
063E 0 4400 OFC4 H50E BSI L F005      3A135640
0640 0 70EC      MDX      A50E      3A135650
*****
0641 0 2003      B500 LOS 3          3A135660
0642 0 C01B      LD N503      3A135670
0643 0 4B0B      BSC E          3A135680
0644 0 700C      MDX      S501      3A135690
0645 0 2B17      STS      N505      3A135700
0646 0 C016      LO N505      3A135710
0647 0 F016      EOR      N506      3A135720
0648 0 4C1B 0654 BSC L S503,&- 3A135730
064A 0 4400 OF69 BSI L F000      3A135740
064C 0 30B5      OC /30B5      3A135750
064D 0 4400 OFC4 BSI L F005      3A135760
064F 0 70F1      MDX      B500      3A135770
0650 0 700F      MDX      A540      3A135780
0651 0 4400 OF69 S501 BSI L F000      3A135790
0653 0 30B6      DC /30B6      3A135800
0654 0 4400 OFC4 S503 BSI L F005      3A135810
0656 0 70EA      MDX      B500      3A135820
0657 0 700B      MDX      A540      3A135830
0658 0 8001      N500 DC /B001      3A135840
0659 0 0000      N501 OC /0000      3A135850
065A 0 8000      N502 DC /B000      3A135860
065B 0 0001      N503 DC /0001      3A135870
065C 0 0004      N504 OC /0004      3A135880
065D 0 0000      N505 OC *-      3A135890
065E 0 0003      N506 OC /0003      3A135900
065F 0 0002      N542 OC /0002      3A135910
*                *                3A135920
*                *                3A135930
*                *                3A135940
*                *                3A135950
*                *                3A135960
*                *                3A135970
*****
CORE DATA OR *LA- OPER- 3A135980
ADDR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS ID&SEQ# AT RIGHT 3A135990
*****
0660 0 2003      A540 LOS 3          3A136000
0661 0 C0F6      LO N500      3A136010
0662 0 442F 0674 BSI L G540,ECO&Z BR ON NOT EVEN, CARRY, OF, 3A136020
0664 0 7001      MOX      H540      3A136030
*                * NOT PLUS OR NOT ZERO 3A136040
*                *                3A136050
```

CPU FUNCTION TEST

```
0665 0 7007      MOX      J540      3A136060
0666 0 4400 OF69 H540 BSI L F000      3A136070
0668 0 30B7      DC /30B7      3A136080
0669 0 4400 OF9B BSI L F00E      3A136090
066B 0 70F4      MDX      A540      3A136100
066C 0 7014      MOX      A544      3A136110
066D 0 4400 OF69 J540 BSI L F000      3A136120
066F 0 30BB      DC /30BB      3A136130
0670 0 4400 OF9B BSI L F00E      3A136140
0672 0 70E0      MOX      A540      3A136150
0673 0 7001      MDX      G540&E1 SK TO WORD AFTER G540 3A136160
0674 0 0000      G540 DC /0000      3A136170
0675 0 2BE7      STS      N505      3A136180
0676 0 C0E6      LO N505      3A136190
0677 0 F400 065F EOR L N542      3A136200
0679 0 4C1B 067E BSC L G542,&- 3A136210
067B 0 4400 OF69 BSI L F000      3A136220
067D 0 30B9      DC /30B9      3A136230
067E 0 4400 OFC4 G542 BSI L F005      3A136240
0680 0 700F      MOX      A540      3A136250
*****
0681 0 C400 065F A544 LD L N542      3A136260
0683 0 4430 0695 BSI L G544,Z- LD /0002 3A136270
0685 0 7001      MOX      H544      3A136280
0686 0 7007      MOX      J544      3A136290
0687 0 4400 OF69 H544 BSI L F000      3A136300
0689 0 30BA      DC /30BA      3A136310
068A 0 4400 OFC4 BSI L F005      3A136320
068C 0 70F4      MOX      A544      3A136330
068D 0 700B      MOX      A546      3A136340
068E 0 4400 OF69 J544 BSI L F000      3A136350
0690 0 30BB      OC /30BB      3A136360
0691 0 4400 OFC4 BSI L F005      3A136370
0693 0 70E0      MOX      A544      3A136380
0694 0 7001      MOX      A546      3A136390
0695 0 0000      G544 DC /0000      3A136400
*****
0696 0 C0C2      A546 LD N501      3A136410
0697 0 4420 0698 BSI L G546,Z BR WHEN NOT ZERO 3A136420
0699 0 700C      MDX      J546      3A136430
069A 0 700B      MOX      H546      3A136440
069B 0 0000      G546 OC /0000      3A136450
069C 0 4400 OF69 BSI L F000      3A136460
069E 0 30BC      DC /30BC      3A136470
069F 0 4400 OFC4 BSI L F005      3A136480
06A1 0 70F4      MDX      A546      3A136490
06A2 0 7006      MOX      A54B      3A136500
06A3 0 4400 OF69 H546 BSI L F000      3A136510
06A5 0 30B0      DC /30B0      3A136520
06A6 0 4400 OFC4 J546 BSI L F005      3A136530
06AB 0 70ED      MDX      A546      3A136540
*****
CORE DATA OR *LA- OPER- 3A136550
ADDR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS ID&SEQ# AT RIGHT 3A136560
*****
06A9 0 C0AE      A54B LD N500      3A136570
06AA 0 4410 06B4 BSI L G54B,- BR WHEN NOT MINUS 3A136580
06AC 0 700B      MOX      H54B      3A136590
06AD 0 4400 OF69 BSI L F000      3A136600
06AF 0 30BF      DC /30BF      3A136610
06B0 0 4400 OFC4 BSI L F005      3A136620
06B2 0 70F6      MOX      A548      3A136630
06B3 0 7007      MOX      A54A      3A136640
06B4 0 0000      G54B DC /0000      3A136650
06B5 0 4400 OF69 BSI L F000      3A136660
06B7 0 30BF      OC /30BF      3A136670
06B8 0 4400 OFC4 H54B BSI L F005      3A136680
*                *                3A136690
*                *                3A136700
*                *                3A136710
*                *                3A136720
*                *                3A136730
```

068A	O	70EE		MOX	A548	LOOP	3A136740	
*****							3A136750	
068B	O	COA3		A54A	LD	N542	3A136760	
068C	O	4408	06C6	BSI	L	G54A,E	BR WHEN NOT PLUS	
068E	O	7008		MOX		H54A	3A136770	
06BF	O	4400	OF69	BSI	L	F000	BSI SKPD ON COND TRUE	
06C1	O	30C0		DC		/30C0	ERR ID	
06C2	O	4400	0FC4	BSI	L	F005	CK LOCK ON ERKOR	
06C4	O	70F6		MDX		A54A	LOOP	
06C5	O	7007		MDX		A54C	EXIT TO NEXT ROUTINE	
06C6	O	0000		G54A	OC	/0000	3A136820	
06C7	O	4400	OF69	BSI	L	F000	BSI BRNCHO-SHOULD NOT	
06C9	O	30C1		OC		/30C1	ERR ID	
06CA	O	4400	0FC4	H54A	BSI	L F005	CK LOCK ON ERROR	
06CC	O	70EE		MOX		A54A	LOOP	
*****							3A136880	
06CD	O	C091		A54C	LD	N542	3A136890	
06CE	O	4404	06DB	BSI	L	G54A,E	BR WHEN NOT EVEN	
06D0	O	7008		MDX		H54C	3A136900	
06D1	O	4400	OF69	BSI	L	F000	BSI SKPD ON COND TRUE	
06D3	O	30C2		DC		/30C2	ERR ID	
06D4	O	4400	0FC4	BSI	L	F005	CK LOCK ON ERROR	
06D6	O	70F6		MOX		A54C	LOOP	
06D7	O	7007		MOX		A54E	EXIT TO NEXT ROUTINE	
06D8	O	0000		G54C	OC	/0000	3A136920	
06D9	O	4400	OF69	BSI	L	F000	BSI BRNCHO-SHOULD NOT	
06DB	O	30C3		OC		/30C3	ERR IO	
06DC	O	4400	0FC4	H54C	BSI	L F005	CK LOCK ON ERROR	
06DE	O	70EE		MOX		A54C	LOOP	
*****							3A137000	
06DF	O	2000		A54E	LDS	O	SET C AND OF OFF	
06E0	O	4402	06EA	BSI	L	G54E,C	BR IF CARRY IS ON	
06E2	O	7008		MOX		H54E	3A137040	
06E3	O	4400	OF69	BSI	L	F000	BSI SKPD ON COND TRUE	
06E5	O	30C4		OC		/30C4	ERR IO	
06E6	O	4400	0FC4	BSI	L	F005	CK LOCK ON ERROR	
06E8	O	70F6		MDX		A54E	LOOP	
06E9	O	7007		MOX		A54F	EXIT TO NEXT ROUTINE	
06EA	O	0000		G54E	OC	/0000	3A137070	
06EB	O	4400	OF69	BSI	L	F000	BSI BRNCHO-SHOULD NOT	
06ED	O	30C5		OC		/30C5	ERR IO	
06EE	O	4400	0FC4	H54E	BSI	L F005	CK LOCK ON ERROR	
06FO	O	70EE		MDX		A54E	LOOP	
*****							3A137100	
06F1	O	2000		A54F	LDS	O	SET C AND OF OFF	
06F2	O	4401	06FO	BSI	L	G54F,O	BR ON OVERFLOW	
06F4	O	700C		MOX		H54F	3A137160	
06F5	O	4400	OF69	BSI	L	F000	BSI SKPD ON COND TRUE	
06F7	O	30C6		OC		/30C6	ERR IO	
06F8	O	30C6		OC		/30C6	ERR IO	
06F9	O	4400	0FC4	BSI	L	F005	CK LOCK ON ERROR	
06FB	O	70F5		MOX		A54F	LOOP	
06FC	O	7007		MDX		A580	EXIT TO NEXT ROUTINE	
06FD	O	0000		G54F	DC	/0000	3A137200	
06FE	O	4400	OF69	BSI	L	F000	BSI BRNCHO-SHOULD NOT	
0700	O	30C7		DC		/30C7	ERR IO	
0701	O	4400	0FC4	H54F	BSI	L F005	CK LOCK ON ERROR	
0703	O	70EO		MOX		A54F	LOOP	
* * *							3A137300 3A137310 3A137320	
TEST OF LOO OPERATION							3A137330	
* * *							3A137340 3A137350 3A137360	

CORE	DATA OR	*LA- OPER-					3A137370	
ADDR	INSTRUCTION	*REL ATION FT OPERANDS & REMARKS	IO&SEQ# AT RIGHT				3A137380	
*****								3A137390
0704	O	CC00	0788	A580	LDO	L NSC1	LOO A#/0000 Q#/0000	
0706	O	4C18	070B	BSC	L	G580.E-	BRANCH ON ZERO	
								3A137400 3A137410

DATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68	PROG 10	03A1-1
EC NO.	415490	415490C	419643	420403	420403A	PAGE	28

ADDRESS	DATA OR INSTRUCTION	LA-OPER- BEL ATION	FT OPERANDS	REMARKS	ID=SEQ# AT RIGHT
0708	0 4400 0F69		BSI L	F000	LDD-A REG INCORRECT
070A	0 30C8		DC	/30C8	ERR ID
070B	0 4400 0F98	G580	BSI L	F00E	CK LOCK ON ERROR
070D	0 70F6		MDX	A580	LOOP
070E	0 18D0		RTE	16	
070F	0 4C18 0714		BSC L	G582, E-	BRANCH ON ZERO
0711	0 4400 0F69		BSI L	F000	LDD-Q REG INCORRECT
0713	0 30C9		DC	/30C9	ERR ID
0714	0 4400 0FC4	G582	BSI L	F005	CK LOCK ON ERROR
0716	0 70ED		MDX	A580	LOOP

0717	0 C872	A584	LDD	N5C3	LD A#/FFFF Q#/FFFF
0718	0 F072		EOR	N5C4	ZERO WITH /FFFF
0719	0 4C18 071E		BSC L	G584, E-	BRANCH ON ZERO
071B	0 4400 0F69		BSI L	F000	LDD-A REG INCORRECT
071D	0 30CA		DC	/30CA	ERR ID
071E	0 4400 0F98	G584	BSI L	F00E	CK LOCK ON ERROR
0720	0 70F6		MDX	A584	LOOP
0721	0 18D0		RTE	16	NOW A#/FFFF Q#/0000
0722	0 F068		EOR	N5C4	ZERO WITH /FFFF
0723	0 4C18 0728		BSC L	G586, E-	BRANCH ON ZERO
0725	0 4400 0F69		BSI L	F000	LDD-Q REG INCORRECT
0727	0 30CB		DC	/30CB	ERR ID
0728	0 4400 0FC4	G586	BSI L	F005	CK LOCK ON ERROR
072A	0 70EC		MDX	A584	LOOP

072B	0 C85C	A588	LDD	N5C1	LD A#/0000 Q#/0000
072C	0 4C18 0731		BSC L	G588, E-	BRANCH ON ZERO
072E	0 4400 0F69		BSI L	F000	LDD-ODD-A REG FAILED
0730	0 30CC		DC	/30CC	ERR ID
0731	0 4400 0F98	G588	BSI L	F00E	CK LOCK ON ERROR
0733	0 70F7		MDX	A588	LOOP
0734	0 18D0		RTE	16	NOW A#/FFFF Q#/0000
0735	0 4C18 073A		BSC L	G58A, E-	BRANCH ON ZERO
0737	0 4400 0F69		BSI L	F000	LDD-ODD-Q REG FAILED
0739	0 30CD		DC	/30CD	ERR ID
073A	0 4400 0FC4	G58A	BSI L	F005	CK LOCK ON ERROR
073C	0 70EE		MDX	A588	LOOP
* * * TEST OF STO OPERATION * * *****					

CORE	DATA OR INSTRUCTION	LA-OPER- BEL ATION	FT OPERANDS	REMARKS	ID=SEQ# AT RIGHT

073D	0 C84A	A5C0	LDD	N5C1	LD A#/0000 Q#/0000
073E	0 084D		STO	N5C5	
073F	0 C04C		LD	N5C5	LD A#/0000 Q#/0000
0740	0 4C18 0745		BSC L	G5C0, E-	BRANCH ON ZERO
0742	0 4400 0F69		BSI L	F000	STO-EA INCORRECT
0744	0 30CF		DC	/30CF	ERR ID
0745	0 4400 0F98	G5C0	BSI L	F00E	CK LOCK ON ERROR
0747	0 70F5		MDX	A5C0	LOOP
0748	0 C044		LO	N5C6	LO /FFFF
0749	0 4C18 074E		BSC L	G5C2, E-	BRANCH ON ZERO
074B	0 4400 0F69		BSI L	F000	STG-EA&1 INCORRECT
074D	0 30CF		DC	/30CF	ERR ID
074E	0 4400 0FC4	G5C2	BSI L	F005	CK LOCK ON ERROR
0750	0 70EC		MDX	A5C0	LOOP

0751	0 C036	A5C4	LO	N5C1	LO /0000
0752	0 0039		STO	N5C5	STORE /0000
0753	0 0039		STO	N5C6	STORE /0000
0754	0 C835		LDD	N5C3	LO A#/FFFF Q#/FFFF
0755	0 0836		STO	N5C5	STORE /FFFF AND /FFFF
0756	0 C035		LO	N5C5	LO /FFFF
0757	0 F032		EOR	N5C3	ZERO WITH /FFFF

DATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68	PROG 10	03A1-1
EC NO.	415490	415490C	410643	420403	420403A	PAGE	28A

CPU FUNCTION TEST

```
0891 0 4400 0F69      8SI L F000      XR 3 CHANGED
0893 0 3158           DC      /3158      ERR ID
0894 0 4400 0FC4      G661 8SI L F005      CK LOCK ON ERROR
0896 0 70E8           MOX      A660      LOOP
*****
0897 0 6100           A662 LDX 1 0        LO XR 1 WITH /0000
0898 0 6200           LDX 2 0        LO XR 2 WITH /0000
0899 0 6300           LDX 3 0        LO XR 3 WITH /0000
089A 0 62FF           LDX 2 -1       LO XR 2 WITH /FFFF
089B 0 692C           STX 1 N660      STORE C&XR 1 AT N660
089C 0 C028           LO      N660      LD C&N660
089D 0 4C18 08A2      8SC L G662,&-    BRANCH ON ZERO
089F 0 4400 0F69      8SI L F000      XR 1 CHANGED
08A1 0 3159           DC      /3159      ERR ID
08A2 0 4400 0F98      G662 8SI L F00E      CK LOCK ON ERROR
08A4 0 70F2           MDX      A662      LOOP
08A5 0 6822           STX 3 N660      STORE C&XR 3 AT N660
08A6 0 C021           LD      N660      LD C&N660
08A7 0 4C18 08AC      8SC L G663,&-    BRANCH ON ZERO
08A9 0 4400 0F69      8SI L F000      CK LOCK ON ERROR
08AB 0 315A           DC      /315A      ERR ID
08AC 0 4400 0FC4      G663 8SI L F005      CK LOCK ON ERROR
08AE 0 70E8           MOX      A662      LOOP
*****
08AF 0 6100           A664 LDX 1 0        CK DISTRUCTION OF
08B0 0 6200           LDX 2 0        OTHER INDEXES
08B1 0 6300           LDX 3 0        XRS HAVE /0000
08B2 0 63FF           LOX 3 -1       LO XR 3 WITH /FFFF
08B3 0 6914           STX 1 N660      STORE C&XR 1 AT N660
08B4 0 C013           LD      N660      LD C&N660
08B5 0 4C18 08BA      8SC L G664,&-    BRANCH ON ZERO
08B7 0 4400 0F69      8SI L F000      XR 1 CHANGED
08B9 0 3158           DC      /3158      ERR ID
08BA 0 4400 0F98      G664 8SI L F00E      CK LOCK ON ERROR
08BC 0 70F2           MOX      A664      LOOP
08BD 0 6A0A           STX 2 N660      STORE C&XR 2 AT N660
08BE 0 C009           LO      N660      LD C&N660
08BF 0 4C18 08C4      8SC L G665,&-    BRANCH ON ZERO
08C1 0 4400 0F69      8SI L F000      XR 2 CHANGED
08C3 0 315C           DC      /315C      ERR ID
08C4 0 4400 0FC4      G665 8SI L F005      CK LOCK ON ERROR
08C6 0 70E8           MOX      A664      LOOP
08C7 0 7001           MDX      A670      EXIT TO NEXT ROUTINE
08C8 0 0000           N660 DC 0
*****
08C9 0 6110           A670 LDX 1 16       LO XR 1 WITH /0010
08CA 0 C010           LD      N670      LOAD ONE
08CB 0 4C18 0804      G671 8SC L G670,&-    NOT BR FOR CORRECT OP
08CC 0 1001           G672 SLA 1        -1 FROM C&XR 1
08CE 0 71FF           MDX 1 -1       -1 FROM C&XR 1
08CF 0 70F8           MOX      G671
08D0 0 4400 0FC4      8SI L F005      CK LOCK ON ERROR
08D2 0 70F6           MDX      A670      LOOP
08D3 0 7008           MOX      A680      EXIT TO NEXT ROUTINE
08D4 0 4400 0F69      G670 8SI L F000      WRONG DECODE OF ZERO ACC
08D6 0 3169           DC      /3169      ERR ID
08D7 0 4400 0F98      8SI L F00E      CK LOCK ON ERROR
08D9 0 70EF           MDX      A670      LOOP
08DA 0 70F2           MOX      G672
08DB 0 0001           N670 DC 1
*
* TEST OF ADD OPERATION
*
*****
*****
CORE DATA CR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS ID&SEQ# AT RIGHT
*****
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403APROG ID 03A1-1
PAGE 31

CPU FUNCTION TEST

```
080C 0 2002           A680 LDS 2        SET CARRY ON
080D 0 C06E           LO      N680      LD /FFFF
080E 0 806E           A      N681      A /0000
080F 0 4C01 08E2      8SC L G680,&0    CK FOR OVERFLOW ON
08E1 0 7003           MOX      H680      OVERFLOW IS OFF
08E2 0 4400 0F69      G680 8SI L F000      OVERFLOW IS ON
08E4 0 30E5           DC      /30E5      ERR ID
08E5 0 4400 0F98      H680 8SI L F00E      CK LOCK ON ERROR
08E7 0 70F4           MDX      A680      LOOP
08E8 0 F063           EOR      N680      CK IF ADD ZERO
08E9 0 4C18 08EE      8SC L G682,&-    * CHANGED ACC
08E8 0 4400 0F69      8SI L F000      ADD 1 AND 0 FAILED
08ED 0 30E6           DC      /30E6      ERR ID
08EE 0 4400 0FC4      G682 8SI L F005      CK LOCK ON ERROR
08F0 0 70E8           MOX      A680      LOOP
*****
08F1 0 2000           A684 LDS 0        SET C AND OF OFF
08F2 0 C059           LD      N680      LD /FFFF
08F3 0 805A           A      N682      A /0001
08F4 0 4C02 08F9      8SC L G684,&C    CK IF CARRY OCCURED
08F6 0 4400 0F69      8SI L F000      CARRY NOT ON
08F8 0 30E7           DC      /30E7      ERR ID
08F9 0 4400 0F98      G684 8SI L F00E      CK LOCK ON ERROR
08FB 0 70F5           MDX      A684      LOOP
08FC 0 4C18 0901      8SC L G686,&-    BRANCH ON ZERO
08FE 0 4400 0F69      8SI L F000      ADD FFFF&0001 FAILED
0900 0 30E8           DC      /30E8      ERR ID
0901 0 4400 0FC4      G686 8SI L F005      CK LOCK ON ERROR
0903 0 70ED           MOX      A684      LOOP
*****
0904 0 2000           A688 LDS 0        SET C AND OF OFF
0905 0 C046           LO      N680      LD /FFFF
0906 0 8045           A      N680      A /FFFF
0907 0 4C02 090C      8SC L G688,&C    BR ON CARRY
0909 0 4400 0F69      8SI L F000      CARRY NOT ON
090B 0 30E9           DC      /30E9      ERR ID
090C 0 4400 0F98      G688 8SI L F00E      CK LOCK ON ERROR
090E 0 70F5           MOX      A688      LOOP
090F 0 F042           EOR      N687      ZERO WITH /FFFF
0910 0 4C18 0915      8SC L G68A,&-    BRANCH ON ZERO
0912 0 4400 0F69      8SI L F000      ADD FFFF&FFFF FAILED
0914 0 30FA           DC      /30FA      ERR ID
0915 0 4400 0FC4      G68A 8SI L F005      CK LOCK ON ERROR
0917 0 70EC           MOX      A688      LOOP
*****
0918 0 2000           A68C LDS 0        SET C AND OF OFF
0919 0 C035           LO      N683      LD /4000
091A 0 8034           A      N683      A /4000
091B 0 4C01 0920      8SC L G68C,&0    BR IF OF NOT ON
091D 0 4400 0F69      8SI L F000      OVERFLOW NOT ON
091F 0 30E8           DC      /30E8      ERR ID
0920 0 4400 0F98      G68C 8SI L F00E      CK LOCK ON ERROR
0922 0 70F5           MOX      A68C      LOOP
0923 0 F02C           EOR      N684      ZERO WITH /8000
0924 0 4C18 0929      8SC L G68E,&-    BRANCH ON ZERO
0926 0 4400 0F69      8SI L F000      ADD 4000&4000 FAILED
0928 0 30EC           DC      /30EC      ERR ID
0929 0 4400 0FC4      G68E 8SI L F005      CK LOCK ON ERROR
092B 0 70EC           MOX      A68C      LOOP
*****
092C 0 2000           B680 LDS 0        SET C AND OF OFF
092D 0 C022           LO      N684      LD /8000
092E 0 8021           A      N684      A /8000
092F 0 2823           STS      N688      STORE C AND OF COND
0930 0 4C18 0935      8SC L J680,&-    BRANCH ON ZERO
0932 0 4400 0F69      8SI L F000      ADD 8000&8000 FAILED
0934 0 30ED           DC      /30ED      ERR ID
0935 0 4400 0F98      J680 8SI L F00E      CK LOCK ON ERROR
```

DATE 02JAN66 01MAY66 15NOV66 15FEB68 26AUG68
EC NO. 415490 415490C 419643 420403 420403APROG ID 03A1-1
PAGE 31A

CPU FUNCTION TEST

0937	0	70F4		MOX	8680	LOOP
0938	0	C01A		LD	N688	LD C AND OF COND
0939	0	F017		EOR	N686	ZERO WITH /0003
093A	0	4C18	0948	85C	L J682, E-	BRANCH ON ZERO
093C	0	4C04	0945	85C	L K682, E	BR ON NOT EVEN
093E	0	4400	0F69	85I	L F000	CARRY NOT ON
0940	0	30EF		OC	/30EF	ERR IO
0941	0	4400	0FC4	85I	L F005	CK LOCK ON ERROR
0943	0	70E8		MOX	8680	LOOP
0944	0	700F		MOX	A6C0	EXIT TO NEXT ROUTINE
0945	0	4400	0F69	K682 85I	L F000	OVERFLOW NOT ON
0947	0	30EE		OC	/30EE	ERR IO
0948	0	4400	0FC4	J682 85I	L F005	CK LOCK ON ERROR
094A	0	70E1		MOX	8680	LOOP
0948	0	7008		MOX	A6C0	EXIT TO NEXT ROUTINE
094C	0	FFFF		N680 OC	/FFFF	
094D	0	0000		N681 OC	/0000	
094E	0	0001		N682 OC	/0001	
094F	0	4000		N683 OC	/4000	
0950	0	8000		N684 OC	/8000	
0951	0	0003		N686 OC	/0003	
0952	0	FFFE		N687 OC	/FFFE	
0953	0	0000		N688 OC	/0000	STORAGE

INDEXING TEST

CORE	DATA OR	*LA-	OPER-			IOESEQ# AT RIGHT
ADDR	INSTRUCTION	*BEL	ATION	FT	OPERANDS & REMARKS	
0954	0 61FC	A6C0	LOX	1 -4	LO XR 1 WITH -4	
0955	0 C500 0900		LO	L1 N6C4	LO C&N6C4&XR 1	
0957	0 F074		EOR	N6C0	ZERO ACC IF CORRECT OP	
0958	0 4C20 0966		BSC	L H6C0,2	BR IF NOT ZERO	
095A	0 697A		STX	1 N6C9	STORE C&XR 1 AT N6C9	
0958	0 C079		LO	N6C9	GET XR 1 VALUE	
095C	0 F079		EOR	N6CA	ZERO ACC IF CORRECT	
095D	0 4C18 0969		BSC	L G6C0,&-	BRANCH ON ZERO	
095F	0 4400 0F69		BSI	L F000	XR 1 LOADED WRONG	
0961	0 30F0		OC	/30F0	ERR IO	
0962	0 4400 0FC4		BSI	L F005	CK LOCK ON ERROR	
0964	0 70EF		MOX	A6C0	LOOP	
0965	0 7006		MOX	A6C2	EXIT TO NEXT ROUTINE	
0966	0 4400 0F69	H6C0	BSI	L F000	WRONG LOCATION	
0968	0 30F1		OC	/30F1	ERR IO	
0969	0 4400 0FC4	G6C0	BSI	L F005	CK LOCK ON ERROR	
0968	0 70E8		MOX	A6C0	LOOP	

096C	0 6204	A6C2	LOX	2 4	LO XR 2 WITH &4	
0960	0 C600 09D0		LO	L2 N6C4	LO C&N6C4&XR 2	
096F	0 F064		EOR	N6C8	ZERO ACC IF CORRECT	
0970	0 4C20 097E		BSC	L H6C2,2	BR IF NOT ZERO	
0972	0 6A62		STX	2 N6C9	STORE XR 2 AT N6C9	
0973	0 C061		LO	N6C9	GET XR 2 VALUE	
0974	0 F062		EOR	N6C8	ZERO ACC IF CORRECT	
0975	0 4C18 0981		BSC	L G6C2,&-	BRANCH ON ZERO	
0977	0 4400 0F69		BSI	L F000	XR 2 LOADED WRONG	
0979	0 30F2		OC	/30F2	ERR IO	
097A	0 4400 0FC4		BSI	L F005	CK LOCK ON ERROR	
097C	0 70EF		MOX	A6C2	LOOP	
097D	0 7006		MOX	A6C4	EXIT TO NEXT ROUTINE	
097E	0 4400 0F69	H6C2	BSI	L F000	WRONG LOCATION	
0980	0 30F3		OC	/30F3	ERR IO	
0981	0 4400 0FC4	G6C2	BSI	L F005	CK LOCK ON ERROR	
0983	0 70E8		MOX	A6C2	LOOP	

0984	0 6300	A6C4	LOX	3 0	SET XR 3 TO ZERO	

CPU FUNCTION TEST

Address	Instruction	Op	Op2	Op3	Op4	Op5	Op6	Op7	Op8	Op9	Op10	Op11	Op12	Op13	Op14	Op15	Op16	Op17	Op18	Op19	Op20	Op21	Op22	Op23	Op24	Op25	Op26	Op27	Op28	Op29	Op30	Op31	Op32	Op33	Op34	Op35	Op36	Op37	Op38	Op39	Op40	Op41	Op42	Op43	Op44	Op45	Op46	Op47	Op48	Op49	Op50	Op51	Op52	Op53	Op54	Op55	Op56	Op57	Op58	Op59	Op60	Op61	Op62	Op63	Op64	Op65	Op66	Op67	Op68	Op69	Op70	Op71	Op72	Op73	Op74	Op75	Op76	Op77	Op78	Op79	Op80	Op81	Op82	Op83	Op84	Op85	Op86	Op87	Op88	Op89	Op90	Op91	Op92	Op93	Op94	Op95	Op96	Op97	Op98	Op99	Op100	Op101	Op102	Op103	Op104	Op105	Op106	Op107	Op108	Op109	Op110	Op111	Op112	Op113	Op114	Op115	Op116	Op117	Op118	Op119	Op120	Op121	Op122	Op123	Op124	Op125	Op126	Op127	Op128	Op129	Op130	Op131	Op132	Op133	Op134	Op135	Op136	Op137	Op138	Op139	Op140	Op141	Op142	Op143	Op144	Op145	Op146	Op147	Op148	Op149	Op150	Op151	Op152	Op153	Op154	Op155	Op156	Op157	Op158	Op159	Op160	Op161	Op162	Op163	Op164	Op165	Op166	Op167	Op168	Op169	Op170	Op171	Op172	Op173	Op174	Op175	Op176	Op177	Op178	Op179	Op180	Op181	Op182	Op183	Op184	Op185	Op186	Op187	Op188	Op189	Op190	Op191	Op192	Op193	Op194	Op195	Op196	Op197	Op198	Op199	Op200	Op201	Op202	Op203	Op204	Op205	Op206	Op207	Op208	Op209	Op210	Op211	Op212	Op213	Op214	Op215	Op216	Op217	Op218	Op219	Op220	Op221	Op222	Op223	Op224	Op225	Op226	Op227	Op228	Op229	Op230	Op231	Op232	Op233	Op234	Op235	Op236	Op237	Op238	Op239	Op240	Op241	Op242	Op243	Op244	Op245	Op246	Op247	Op248	Op249	Op250	Op251	Op252	Op253	Op254	Op255	Op256	Op257	Op258	Op259	Op260	Op261	Op262	Op263	Op264	Op265	Op266	Op267	Op268	Op269	Op270	Op271	Op272	Op273	Op274	Op275	Op276	Op277	Op278	Op279	Op280	Op281	Op282	Op283	Op284	Op285	Op286	Op287	Op288	Op289	Op290	Op291	Op292	Op293	Op294	Op295	Op296	Op297	Op298	Op299	Op300	Op301	Op302	Op303	Op304	Op305	Op306	Op307	Op308	Op309	Op310	Op311	Op312	Op313	Op314	Op315	Op316	Op317	Op318	Op319	Op320	Op321	Op322	Op323	Op324	Op325	Op326	Op327	Op328	Op329	Op330	Op331	Op332	Op333	Op334	Op335	Op336	Op337	Op338	Op339	Op340	Op341	Op342	Op343	Op344	Op345	Op346	Op347	Op348	Op349	Op350	Op351	Op352	Op353	Op354	Op355	Op356	Op357	Op358	Op359	Op360	Op361	Op362	Op363	Op364	Op365	Op366	Op367	Op368	Op369	Op370	Op371	Op372	Op373	Op374	Op375	Op376	Op377	Op378	Op379	Op380	Op381	Op382	Op383	Op384	Op385	Op386	Op387	Op388	Op389	Op390	Op391	Op392	Op393	Op394	Op395	Op396	Op397	Op398	Op399	Op400	Op401	Op402	Op403	Op404	Op405	Op406	Op407	Op408	Op409	Op410	Op411	Op412	Op413	Op414	Op415	Op416	Op417	Op418
---------	-------------	----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

DATE	02JAN66	01MAY66	15NOV66	15FE868	26AUG68
EC NO.	415490	415490C	419643	420403	420403A

PROG ID 03A1-1
PAGE 32

DATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68
EC NO.	415490	415490C	419643	420403	420403A

PROG ID 03A1-1
PAGE 32A

CPU FUNCTION TEST

```
*****
CORE DATA OR *LA- DPER-
ADDR INSTRUCTION *BEL ATION FT DPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
09DC 0 6500 09CD A6D0 LDX L1 M6C1 LD XR 1 WITH ADDRESS 3A143540
* * DF N6C1 3A143550
09DE 0 C1FF LO 1 -1 SHDRT FORM INDEXING 3A143560
09DF 0 F0EC EOR N6C0 ZERO IF CORRECT 3A143570
09E0 0 4C18 09E5 BSC L M6D0,&- BRANCH ON ZERO 3A143580
09E2 0 4400 0F69 BSI L F000 INDEXED LD INST. FAILED 3A143590
09E4 0 315D DC /3150 ERR ID 3A143600
09E5 0 4400 0FC4 M600 BSI L F005 CK LOCK ON ERROR 3A143610
09E7 0 70F4 MDX A600 LOOP 3A143620
*****
09E8 0 6600 09C0 A6D2 LDX L2 M6C1 LD XR 2 WITH ADDRESS 3A143630
* * OF N6C1 3A143640
09EA 0 C201 LD 2 1 LD C&DF ADDRESS IN XR 1&1 3A143650
09EB 0 F0E2 EOR N6C2 ZERO IF CORRECT 3A143660
09EC 0 4C18 09F1 BSC L M6D2,&- BRANCH ON ZERO 3A143670
09EE 0 4400 0F69 BSI L F000 INDEXED LD INST. FAILED 3A143680
09EF 0 315E DC /315E ERR ID 3A143690
09F0 0 4400 0FC4 M6D2 BSI L F005 CK LOCK ON ERRDR 3A143700
09F3 0 70F4 MDX A6D2 LOOP 3A143710
*****
09F4 0 6700 09CD A6D3 LOX L3 M6C1 LD XR 3 WITH ADD OF M6C1 3A143720
09F6 0 C300 LD 3 0 LD C&DF ADD IN XR 3 & D 3A143730
09F7 0 F0D5 EDR N6C1 ZERO IF CORRECT 3A143740
09F8 0 4C18 09F0 BSC L M6D3,&- BRANCH ON ZERO 3A143750
09FA 0 4400 0F69 BSI L F000 INDEXED LD INST. FAILED 3A143760
09FC 0 315F DC /315F ERR ID 3A143770
09FD 0 4400 0FC4 M6D3 BSI L F005 CK LOCK ON ERROR 3A143780
09FF 0 70F4 MDX A6D3 LOOP 3A143790
*****
0A00 0 6102 A6D5 LDX 1 2 LD XR 1 WITH &2 3A143800
0A01 0 C0D6 LD N6C0 LD /0001 3A143810
0A02 0 1101 SLA 1 1 NOW A#/0004 3A143820
0A03 0 F0D3 EDR N6C8 NOW A#/0000 3A143830
0A04 0 4C18 0A09 BSC L M6D5,&- BRANCH ON ZERO 3A143840
0A06 0 4400 0F69 BSI L F000 INDEXED SLA FAILED 3A143850
0A08 0 3163 DC /3163 ERR ID 3A143860
0A09 0 4400 0FC4 M6D5 BSI L F005 CK LOCK ON ERROR 3A143870
0A0B 0 70F4 MDX A6D5 LOOP 3A143880
*****
0A0C 0 6202 A6D6 LDX 2 2 LD /00004 3A143890
0A0D 0 C0C9 LO N6C8 NOW A#/0001 3A143900
0A0E 0 1A01 SRA 2 1 ZERO ACC 3A143910
0A0F 0 F0C8 EOR N6C0 ZERO WITH /0001 3A143920
0A10 0 4C18 0A15 BSC L M6D6,&- BRANCH ON ZERO 3A143930
0A12 0 4400 0F69 BSI L F000 INDEXED SRA FAILED 3A143940
0A14 0 3164 DC /3164 ERR ID 3A143950
0A15 0 4400 0FC4 M6D6 BSI L F005 CK LOCK ON ERROR 3A143960
0A17 0 70F4 MDX A6D6 LOOP 3A143970
*****
* 3A143980
* 3A143990
* 3A144000
* 3A144010
* 3A144020
* 3A144030
* 3A144040
* 3A144050
* 3A144060
* 3A144070
* 3A144080
* 3A144090
* 3A144100
* 3A144110
* 3A144120
* 3A144130
* 3A144140
* 3A144150
* 3A144160
* 3A144170
* 3A144180
* 3A144190
* 3A144200
* 3A144210
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
0A18 0 6301 A6F0 LOX 3 1 LD XR 3 WITH &1 3A144160
0A19 0 C0DE LD N6F1 LD C&OF LABEL N6F1 3A144170
0A1A 0 4F00 0A10 BSC L3 M6F0 BR TO C&N6F0&XR 3 3A144180
0A1C 0 3000 WAIT INOEXEO BSC FAILED 3A144190
0A1D 0 3000 N6F0 WAIT INOEXEO BSC FAILED 3A144200
0A1E 0 F0D9 EOR N6F1 CK FOR DISTROYED ACC 3A144210
```

CPU FUNCTION TEST

```
0A1F 0 4C18 0A24 BSC L M6F0,&- BRANCH ON ZERO 3A144220
0A21 0 4400 0F69 BSI L F000 ACC DISTROYED 3A144230
0A23 0 3165 DC /3165 ERR ID 3A144240
0A24 0 4400 0FC4 M6F0 BSI L F005 CK LOCK ON ERRDR 3A144250
0A26 0 70F1 MDX A6F0 LOOP 3A144260
0A27 0 7001 MDX A6F1 EXIT TO NEXT ROUTINE 3A144270
0A28 0 0A28 N6F1 DC N6F1 3A144280
*****
0A29 0 6201 A6F1 LOX 2 1 LD XR 2 WITH &1 3A144290
0A2A 0 4E80 0A2D BSC 12 N6F2 BR TO N6F2&1 INDIRECT 3A144300
0A2C 0 7005 MDX M6F1 BSC FAILED 3A144310
0A20 0 7004 N6F2 MDX M6F1 BSC FAILED 3A144320
0A2E 0 0A31 OC N6F3 3A144330
0A2F 0 7002 MDX M6F1 BSC FAILED 3A144340
0A30 0 7001 MDX M6F1 BSC FAILED 3A144350
0A31 0 7003 N6F3 MDX M6F2 3A144360
0A32 0 4400 0F69 M6F1 BSI L F000 BSC DID NOT BRANCH 3A144370
0A34 0 3166 DC /3166 ERR ID 3A144380
0A35 0 4400 0FC4 M6F2 BSI L F005 CK LOCK ON ERRDR 3A144390
0A37 0 70F1 MDX A6F1 LOOP 3A144400
*****
* 3A144410
* 3A144420
* 3A144430
* 3A144440
* 3A144450
* 3A144460
* 3A144470
* 3A144480
* 3A144490
* 3A144500
* 3A144510
* 3A144520
* 3A144530
* 3A144540
* 3A144550
* 3A144560
* 3A144570
* 3A144580
* 3A144590
* 3A144600
* 3A144610
* 3A144620
* 3A144630
* 3A144640
* 3A144650
* 3A144660
* 3A144670
* 3A144680
* 3A144690
* 3A144700
* 3A144710
* 3A144720
* 3A144730
* 3A144740
* 3A144750
* 3A144760
* 3A144770
* 3A144780
* 3A144790
* 3A144800
* 3A144810
* 3A144820
* 3A144830
* 3A144840
* 3A144850
* 3A144860
* 3A144870
* 3A144880
* 3A144890
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
0A66 0 2000 A708 LDS 0 SET C AND OF OFF 3A144870
0A67 0 C030 LO N705 LO /B000 3A144880
0A68 0 9038 S N701 S /0001 3A144890
```

```

0A69 0 2838      STS      N702      SAVE C & OF CONOITION      3A144900
0A6A 0 F03C      EOR      N707      ZERO ACC IF CORRECT OP      3A144910
0A6B 0 4C18 0A70 BSC L G708,E-  BRANCH ON ZERO      3A144920
0A6D 0 4400 0F69 BSI L F000      8000 MINU 0001 FAILED      3A144930
0A6F 0 30FE      OC       /30FE      ERR IO      3A144940
0A70 0 4400 0F98 G70B BSI L F00E      CK LOCK ON ERROR      3A144950
0A72 0 70F3      MOX      A708      LOOP      3A144960
0A73 0 C02E      LO       N702      LO STORE CARRY CONOITION      3A144970
0A74 0 F02C      EOR      N701      ZERO IF CORRECT      3A144980
0A75 0 4C18 0A7A BSC L G70A,E-  BRANCH ON ZERO      3A144990
0A77 0 4400 0F69 BSI L F000      OVERFLOW NOT SET      3A145000
0A79 0 30FF      OC       /30FF      ERR IO      3A145010
0A7A 0 4400 0FC4 G70A BSI L F005      CK LOCK ON ERROR      3A145020
0A7C 0 70E9      MOX      A708      LOOP      3A145030
*****
0A70 0 2000      A70C LOS      0      SET C AND OF OFF      3A145040
0A7E 0 C021      LD       N700      LO /0000      3A145050
0A7F 0 9025      S       N705      S /8000      3A145060
0A80 0 2821      STS      N702      STORE C & OF CONOITION      3A145080
0A81 0 F023      EOR      N705      ZERO ACC IF CORRECT      3A145090
0A82 0 4C18 0A87 BSC L G70C,E-  BRANCH ON ZERO      3A145100
0A84 0 4400 0F69 BSI L F000      0000 MINUS 8000 FAILED      3A145110
0A86 0 3100      OC       /3100      ERR IO      3A145120
0A87 0 4400 0F98 G70C BSI L F00E      CK LOCK ON ERROR      3A145130
0A89 0 70F3      MOX      A70C      LOOP      3A145140
0A8A 0 C017      LO       N702      LO CON OF C&OF      3A145150
0A8B 0 F01A      EOR      N706      ZERO ACC IF CORRECT      3A145160
0A8C 0 4C18 0A9C BSC L G70E,E-  BRANCH ON ZERO      3A145170
0A8E 0 C013      LO       N702      LO CON OF C & OF      3A145180
0A8F 0 E011      ANO      N701      ANO IN /0001      3A145190
0A90 0 4C20 0A99 BSC L J70E,Z  BR IF NOT ZERO      3A145200
0A92 0 4400 0F69 BSI L F000      OVERFLOW NOT ON      3A145210
0A94 0 3101      OC       /3101      ERR IO      3A145220
0A95 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR      3A145230
0A97 0 70E5      MOX      A70C      LOOP      3A145240
0A98 0 700F      MOX      A740      EXIT TO NEXT ROUTINE      3A145250
0A99 0 4400 0F69 J70E BSI L F000      CARRY NOT ON      3A145260
0A9B 0 3102      OC       /3102      ERR IO      3A145270
0A9C 0 4400 0FC4 G70E BSI L F005      CK LOCK ON ERROR      3A145280
0A9E 0 700E      MOX      A70C      LOOP      3A145290
0A9F 0 7008      MOX      A740      EXIT TO NEXT ROUTINE      3A145300
0AA0 0 0000      N700 OC       /0000      3A145310
0AA1 0 0001      N701 OC       /0001      3A145320
0AA2 0 0000      N702 OC       /0000      STORAGE      3A145330
0AA3 0 FFFF      N703 OC       /FFFF      3A145340
0AA4 0 0002      N704 DC       /0002      3A145350
0AA5 0 8000      N705 OC       /8000      3A145360
0AA6 0 0003      N706 OC       /0003      3A145370
0AA7 0 7FFF      N707 OC       /7FFF      3A145380
*
* TEST OF AOD DOUBLE
*
*****
CORE DATA OR *LA- OPER-
AODR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT
*****
0AA8 0 2000      A740 LOS      0      SET C AND OF OFF      3A145400
0AA9 0 CC00 086E LOO L N742      LO A#/FFFF Q#/FFFF      3A145410
0AAB 0 8C00 0B70 AD L N744      A /0000 /0000      3A145420
0AAD 0 2C00 0860 STS L N740      STORE CON. OF C & OF      3A145430
0AAF 0 F400 086E EOR L N742      3A145440
0AB1 0 4C1B 0A86 BSC L G740,E-  BRANCH ON ZERO      3A145450
0AB3 0 4400 0F69 BSI L F000      AO FFFF&0000 A FAILED      3A145460
0AB5 0 3103      OC       /3103      ERR IO      3A145470
0AB6 0 4400 0F98 G740 BSI L F00E      CK LOCK ON ERROR      3A145480
0AB8 0 70EF      MOX      A740      LOOP      3A145490
0AB9 0 18D0      RTE      16      3A145500

```

```

0A8A 0 F400 086E EOR L N742      3A145580
0A8C 0 4C18 0AC1 BSC L G742,E-  BR ON ZERO      3A145590
0A8E 0 4400 0F69 BSI L F000      AO FFFF&0000 Q FAILED      3A145600
0AC0 0 3104      OC       /3104      ERR IO      3A145610
0AC1 0 4400 0F98 G742 BSI L F00E      CK LOCK ON ERROR      3A145620
0AC3 0 70E4      MOX      A740      LOOP      3A145630
0AC4 0 C400 0860 LO L N740      CONOITION OF C & OF      3A145640
0AC6 0 4C18 0A04 BSC L G744,E-  BRANCH ON ZERO      3A145650
0AC8 0 4C04 0A01 BSC L G744,E  BR IF NOT EVEN      3A145660
0ACA 0 4400 0F69 BSI L F000      CARRY ON      3A145670
0ACC 0 3105      OC       /3105      ERR IO      3A145680
0AC0 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR      3A145690
0ACF 0 7008      MOX      A740      LOOP      3A145700
0A00 0 7003      MOX      G744      3A145710
0AD1 0 4400 0F69 H744 BSI L F000      OVFLD ON      3A145720
0A03 0 3106      OC       /3106      ERR IO      3A145730
0A04 0 4400 0FC4 G744 BSI L F005      CK LOCK ON ERROR      3A145740
0A06 0 7001      MOX      A740      LOOP      3A145750
*****
0A07 0 2000      A746 LOS      0      SET C AND OF OFF      3A145760
0A08 0 CC00 0872 LOO L N746      LO A#/0000 Q#/0001      3A145770
0A0A 0 8C00 086E AO L N742      A /FFFF /FFFF      3A145780
0ADC 0 2C00 0860 STS L N740      STORE CONO OF C AND OF      3A145790
0ADE 0 4C18 0AE3 BSC L G746,E-  BRANCH ON ZERO      3A145800
0AE0 0 4400 0F69 BSI L F000      AO 0000&FFFF A FAILED      3A145810
0AE2 0 3107      OC       /3107      ERR IO      3A145820
0AE3 0 4400 0F98 G746 BSI L F00E      CK LOCK ON ERROR      3A145830
0AE5 0 70F1      MOX      A746      LOOP      3A145840
0AE6 0 1800      RTE      16      INTERCHANGE A AND Q      3A145850
0AE7 0 4C18 0AEC BSC L G748,E-  BRANCH ON ZERO      3A145860
0AE9 0 4400 0F69 BSI L F000      AO 0701&FFFF Q FAILED      3A145870
0AEB 0 3108      OC       /3108      ERR IO      3A145880
0AEC 0 4400 0F98 G748 BSI L F00E      CK LOCK ON ERROR      3A145890
0AEE 0 70E8      MOX      A746      LOOP      3A145900
0AEF 0 C400 0860 LO L N740      LO CONO OF C AND OF      3A145910
0AF1 0 F082      EOR      N704      CHECK FOR CARRY      3A145920
0AF2 0 4C18 0B00 BSC L G74A,E-  ZERO# C AND OF OK      3A145930
0AF4 0 4C04 0AF0 BSC L H74A,E  CHECK FOR OVERFLOW %8150      3A145940
0AF6 0 4400 0F69 BSI L F000      CARRY NOT ON      3A145950
0AF8 0 3109      OC       /3109      ERR IO      3A145960
0AF9 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR      3A145970
0AFB 0 7008      MOX      A746      LOOP      3A145980
0AFC 0 7003      MOX      G74A      3A145990
0AFF 0 4400 0F69 H74A BSI L F000      OVFLD ON      3A146000
0A00 0 310A      OC       /310A      ERR IO      3A146010
0B00 0 4400 0FC4 G74A BSI L F005      CK LOCK ON ERROR      3A146020
0B02 0 7004      MOX      A746      LOOP      3A146030
*****
CORE DATA OR *LA- OPER-
AODR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT
*****
0B03 0 2000      A74C LOS      0      SET C AND OF OFF      3A146040
0B04 0 C869      LOO L N742      LO A#/FFFF Q#/FFFF      3A146050
0B05 0 8868      AO L N742      A /FFFF /FFFF      3A146060
0B06 0 2866      STS L N740      STORE C AND OF CONO      3A146070
0B07 0 F066      EOR      N742      ZERO WITH /FFFF      3A146080
0B08 0 4C18 0B00 BSC L G74C,E-  BRANCH ON ZERO      3A146090
0B0A 0 4400 0F69 BSI L F000      AO FFFF&FFFF ACC FAILED      3A146100
0B0C 0 3108      OC       /3108      ERR IO      3A146110
0B0D 0 4400 0F98 G74C BSI L F00E      CK LOCK ON ERROR      3A146120
0B0F 0 70F3      MOX      A74C      LOOP      3A146130
0B10 0 1800      RTE      16      INTERCHANGE A AND Q      3A146140
0B11 0 F062      EOR      N74A      ZERO WITH /FFFF      3A146150
0B12 0 4C18 0B17 BSC L G74E,E-  BRANCH ON ZERO      3A146160
0B14 0 4400 0F69 BSI L F000      AO FFFF&FFFF Q FAILED      3A146170
0B16 0 310C      OC       /310C      ERR IO      3A146180
0B17 0 4400 0F98 G74E BSI L F00E      CK LOCK ON ERROR      3A146190

```

CPU FUNCTION TEST

```
0819 0 70E9      MOX      A74C      LOOP      3A146260
081A 0 C052      LO       N740      CONOITION OF C AND OF 3A146270
081B 0 F05C      EOR      N74B      CHECK FOR OVERFLOW 3A146280
081C 0 4C18 082A BSC L J740,E-    BRANCH ON ZERO 3A146290
081E 0 4C04 0827 BSC L K740,E    CHECK FOR CARRY 3A146300
0820 0 4400 0F69 BSI L F000      CARRY NOT ON 3A146310
0822 0 310E      OC       /310E     ERR IO 3A146320
0823 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR 3A146330
0825 0 7000      MOX      A74C      LOOP      3A146340
0826 0 7003      MOX      J740      3A146350
0827 0 4400 0F69 K740 BSI L F000      OVFLD ON 3A146360
0829 0 310D      OC       /310D     ERR IO 3A146370
082A 0 4400 0FC4 J740 BSI L F005      CK LOCK ON ERROR 3A146380
082C 0 7006      MOX      A74C      LOOP      3A146390
*****
082D 0 2000      8742 LOS      0       SET C AND OF OFF 3A146400
082E 0 C847      LOD      N74C      LO A#/FFFF Q#/7FFF 3A146410
082F 0 8B3E      AO       N742      A /FFFF /FFFF 3A146420
0830 0 283C      STS      N740      STORE CONOITION OF C & OF 3A146430
0831 0 F03C      EOR      N742      3A146440
0832 0 4C18 0837 BSC L J742,E-    BRANCH ON ZERO 3A146450
0834 0 4400 0F69 BSI L F000      AO FFFF&FFFF A FAILED 3A146460
0836 0 310F      OC       /310F     ERR IO 3A146470
0837 0 4400 0F98 J742 BSI L F00E      CK LOCK ON ERROR 3A146480
0839 0 70F3      MOX      B742      LOOP      3A146490
083A 0 18D0      RTE      16       INTERCHANGE A AND Q 3A146500
083B 0 F039      EOR      N74B      3A146510
083C 0 4C18 0841 BSC L J744,E-    BRANCH ON ZERO 3A146520
083E 0 4400 0F69 BSI L F000      AO /7FFF&FFFF Q /FAILED 3A146530
0840 0 3110      OC       /3110     ERR IO 3A146540
0841 0 4400 0F98 J744 BSI L F00E      CK LOCK ON ERROR 3A146550
0843 0 70E9      MOX      B742      LOOP      3A146560
0844 0 C028      LO       N740      LO C AND OF CONOITION 3A146570
0845 0 F032      EOR      N74B      ZERO IF CARRY WAS ON 3A146580
0846 0 4C18 0854 BSC L J746,E-    BRANCH ON ZERO 3A146590
0848 0 4C04 0851 BSC L K746,E    CHECK FOR CARRY 3A146600
084A 0 4400 0F69 BSI L F000      CARRY NOT ON 3A146610
084C 0 3112      OC       /3112     ERR IO 3A146620
084D 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR 3A146630
084F 0 7000      MOX      B742      LOOP      3A146640
0850 0 7003      MOX      J746      3A146650
0851 0 4400 0F69 K746 BSI L F000      OVFLD ON 3A146660
0853 0 3111      OC       /3111     ERR IO 3A146670
0854 0 4400 0FC4 J746 BSI L F005      CK LOCK ON ERROR 3A146680
0856 0 7006      MOX      B742      LOOP      3A146690
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT
*****
0857 0 C81A      B747 LOD      N746      LO A#/0000 Q#/0001 3A146700
0858 0 8B1A      AO       N747      A /0001 /0001 3A146710
0859 0 F019      EOR      N747      ZERO ACC IF CORRECT OP 3A146720
085A 0 4C18 085F BSC L J74B,E-    BRANCH ON ZERO 3A146730
085C 0 4400 0F69 BSI L F000      AD-000 A REG FAILED 3A146740
085E 0 3113      OC       /3113     ERR IO 3A146750
085F 0 4400 0F9B J74B BSI L F00E      CK LOCK ON ERROR 3A146760
0861 0 70F5      MOX      B747      LOOP      3A146770
0862 0 1800      RTE      16       NOW A#/0002 Q#/0000 3A146780
0863 0 F014      EOR      N74B      ZERO ACC IF CORRECT OP 3A146790
0864 0 4C18 0869 BSC L J74A,E-    BRANCH ON ZERO 3A146800
0866 0 4400 0F69 BSI L F000      AD-000 Q REG FAILED 3A146810
0868 0 3114      OC       /3114     ERR IO 3A146820
0869 0 4400 0FC4 J74A BSI L F005      CK LOCK ON ERROR 3A146830
086B 0 70EB      MOX      B747      LOOP      3A146840
086C 0 700C      MOX      A7B0      EXIT TO NEXT ROUTINE 3A146850
086D 0 0000      N740 OC       /0000     3A146860
086E 0000      BSS      E          3A146870
*****
```

CPU FUNCTION TEST

```
086E 0 FFFF      N742 OC       /FFFF      3A146940
086F 0 FFFF      OC       /FFFF      3A146950
0870 0 0000      N744 OC       /0000      3A146960
0871 0 0000      OC       /0000      3A146970
0872 0 0000      N746 OC       /0000      3A146980
0873 0 0001      N747 OC       /0001      3A146990
0874 0 FFFE      N74A OC       /FFFE      3A147000
0875 0 7FFE      N74B OC       /7FFE      3A147010
0876 0 FFFF      N74C OC       /FFFF      3A147020
0877 0 7FFF      OC       /7FFF      3A147030
0878 0 0002      N74B OC       /0002      3A147040
*
*
* TEST SUB DOUBLE
*
*****
0879 0 2000      A780 LOS      0       SET C AND OF OFF 3A147050
087A 0 C867      LOD      N782      LO A#/0000 Q#/0000 3A147060
087B 0 9868      SO       N784      S /0000 /0001 3A147070
087C 0 2B64      STS      N7B0      STORE C AND OF CONOITION 3A147080
087D 0 F068      EOR      N7B6      ZERO WITH /FFFF 3A147090
087E 0 4C1B 0883 BSC L G780,E-    BRANCH ON ZERO 3A147100
0880 0 4400 0F69 BSI L F000      SO 0000-0000 ACC FAILED 3A147110
0882 0 3115      OC       /3115     ERR IO 3A147120
0883 0 4400 0F98 G780 BSI L F00E      CK LOCK ON ERROR 3A147130
0885 0 70F3      MOX      A780      LOOP      3A147140
0886 0 18D0      RTE      16       NOW A#/FFFF Q#/0000 3A147150
0887 0 F05E      EOR      N7B6      ZERO WITH /FFFF 3A147160
0888 0 4C18 0880 BSC L G7B2,E-    BR ON ZERO 3A147170
088A 0 4400 0F69 BSI L F000      SO 0000-0001 Q FAILED 3A147180
088C 0 3116      OC       /3116     ERR IO 3A147190
088D 0 4400 0F98 G7B2 BSI L F00E      CK LOCK ON ERROR 3A147200
088F 0 70E9      MOX      A7B0      LOOP      3A147210
0890 0 C050      LO       N7B0      LO C AND OF CONOITION 3A147220
0891 0 F056      EOR      N7B8      ZERO IF CARRY WAS ON 3A147230
0892 0 4C18 08A0 BSC L G7B4,E-    BRANCH ON ZERO 3A147240
0894 0 4C04 0890 BSC L H784,E    CHECK FOR CARRY 3A147250
0896 0 4400 0F69 BSI L F000      CARRY NOT ON 3A147260
0898 0 3117      OC       /3117     ERR IO 3A147270
0899 0 4400 0FC4 BSI L F005      CK LOCK ON ERROR 3A147280
089B 0 70D0      MOX      A780      LOOP      3A147290
089C 0 7003      MOX      G784      3A147300
089D 0 4400 0F69 H7B4 BSI L F000      OVFLD ON 3A147310
089F 0 3118      OC       /3118     ERR IO 3A147320
08A0 0 4400 0FC4 G7B4 BSI L F005      CK LOCK ON ERROR 3A147330
08A2 0 7006      MOX      A7B0      LOOP      3A147340
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT
*****
08A3 0 2000      A786 LOS      0       SET C AND OF OFF 3A147350
08A4 0 C830      LOD      N782      LO A#/0000 Q#/0000 3A147360
08A5 0 9840      SO       N786      /FFFF /FFFF 3A147370
08A6 0 4C18 08A8 BSC L G7B6,E-    BRANCH ON ZERO 3A147380
08A8 0 4400 0F69 BSI L F000      SO 0000-FFFF A FAILED 3A147390
08AA 0 3119      OC       /3119     ERR IO 3A147400
08AB 0 4400 0F98 G786 BSI L F00E      CK LOCK ON ERROR 3A147410
08AD 0 70F5      MOX      A786      LOOP      3A147420
08AE 0 1800      RTE      16       NOW A#/0001 Q#/0000 3A147430
08AF 0 F035      EOR      N7B5      ZERO WITH /0001 3A147440
08B0 0 4C18 08B5 BSC L G7B8,E-    BRANCH ON ZERO 3A147450
08B2 0 4400 0F69 BSI L F000      SO 0000-FFFF Q FAILED 3A147460
08B4 0 311A      OC       /311A     ERR IO 3A147470
08B5 0 4400 0FC4 G7B8 BSI L F005      CK LOCK ON ERROR 3A147480
08B7 0 70EB      MOX      A7B6      LOOP      3A147490
*****
08B8 0 C831      A78A LOD      N78A      LO A#/0000 Q#/0000 3A147500
08B9 0 982C      SO       N7B6      S /FFFF /FFFF 3A147510
```

```
088A 0 4C18 088F      BSC L G78A,E-  BRANCH ON ZERO      3A147620
088C 0 4400 0F69      BSI L F000      SD 0000-FFFF A FAILED  3A147630
088E 0 3118           OC /3118      ERR IO          3A147640
088F 0 4400 0F98      G78A BSI L F00E      CK LOCK ON ERROR  3A147650
08C1 0 70F6           MOX A78A      LOOP            3A147660
08C2 0 18D0           RTE 16      NOW A#/C001 Q#/0000  3A147670
08C3 0 F025           EOR N780      ZERO WITH /C001  3A147680
08C4 0 4C18 08C9      BSC L G78C,E-  BRANCH ON ZERO      3A147690
08C6 0 4400 0F69      BSI L F000      SO C000-FFFF Q FAILED  3A147700
08C8 0 311C           OC /311C      ERR IO          3A147710
08C9 0 4400 0FC4      G78C BSI L F005      CK LOCK ON ERROR  3A147720
08CB 0 70EC           MDX A78A      LOOP            3A147730
08CC 0 C815           *****
08CO 0 9819           A78E LOO N782      LD A#/0000 Q#/0000  3A147740
08CE 0 4C18 0803      SO N787      S /FFFF /FFFF      3A147750
08D0 0 4400 0F69      BSC L G78E,E-  BRANCH ON ZERO      3A147760
08D2 0 3110           BSI L F000      SO-000 A FAILED  3A147770
08D3 0 4400 0F98      OC /311D      ERR IO          3A147780
08D5 0 70F6           G78E BSI L F00E      CK LOCK ON ERROR  3A147790
08D6 0 1800           MOX A78E      LOOP            3A147800
08D7 0 F000           RTE 16      NOW A#/0001 Q#/0000  3A147810
08D8 0 4C18 0800      EOR N785      ZERO WITH /0001  3A147820
08DA 0 4400 0F69      BSC L H780,E-  BRANCH ON ZERO      3A147830
08DC 0 311E           BSI L F000      SO-000 Q FAILED  3A147840
08DE 0 4400 0FC4      DC /311E      ERR IO          3A147850
08E0 0 70EC           H780 BSI L F005      CK LOCK ON ERROR  3A147860
08E1 0 7008           MOX A78E      LOOP            3A147870
08E2 0 0000           N780 DC /0000      EXIT TO NEXT ROUTINE 3A147880
08E3 0 0000           BSS E          STDRAGE        3A147890
08E4 0 0000           N782 OC /0000      3A147900
08E5 0 0000           OC /0000      3A147910
08E6 0 0000           N784 OC /0000      3A147920
08E7 0 0000           N785 DC /0001      3A147930
08E8 0 0000           N786 DC /FFFF      3A147940
08E9 0 0000           N787 DC /FFFF      3A147950
08EA 0 0000           N788 DC /0002      3A147960
08EB 0 0000           N780 DC /C001      3A147970
08EC 0 0000           N78A DC /0000      3A147980
08ED 0 0000           OC /C000      3A147990
08EE 0 0000           *          3A148000
08EF 0 0000           *          3A148010
08F0 0 0000           *          3A148020
08F1 0 0000           *          3A148030
08F2 0 0000           *          3A148040
08F3 0 0000           *          3A148050
08F4 0 0000           *          3A148060
08F5 0 0000           *          3A148070
08F6 0 0000           *          3A148080
08F7 0 0000           *          3A148090
08F8 0 0000           *          3A148100
08F9 0 0000           *          3A148110
08FA 0 0000           *          3A148120
08FB 0 0000           *          3A148130
08FC 0 0000           *          3A148140
08FD 0 0000           *          3A148150
08FE 0 0000           *          3A148160
08FF 0 0000           *          3A148170
0900 0 0000           *          3A148180
0901 0 0000           *          3A148190
0902 0 0000           *          3A148200
0903 0 0000           *          3A148210
0904 0 0000           *          3A148220
0905 0 0000           *          3A148230
0906 0 0000           *          3A148240
0907 0 0000           *          3A148250
0908 0 0000           *          3A148260
0909 0 0000           *          3A148270
090A 0 0000           *          3A148280
090B 0 0000           *          3A148290
```

TEST OF MULTIPLY OPERATION

```
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT
*****
08EC 0 C04F      A7C0 LO N7C0      LD /5555      3A148060
08ED 0 A04F      M N7C1      M /2AAA      3A148070
08EE 0 F04F      EOR N7C2      ZERO WITH /0E38 3A148080
08EF 0 4C18 08F4 BSC L G7C0,E- BRANCH ON ZERO 3A148090
08F1 0 4400 0F69 BSI L F000      M /5555X/2AAA ACC FAILED 3A148100
08F3 0 311F      OC /311F      ERR IO          3A148110
08F4 0 4400 0F98 G7C0 BSI L F00E      CK LOCK ON ERROR  3A148120
08F6 0 70F5      MDX A7C0      LOOP            3A148130
08F7 0 1800      RTE 16      NOW A#/9C72 Q#/0000  3A148140
08F8 0 F046      EOR N7C3      ZERO WITH /9C72  3A148150
08F9 0 4C18 08FE BSC L G7C2,E-  BRANCH ON ZERO      3A148160
08FB 0 4400 0F69 BSI L F000      MULT 5555X2AAA Q FAILED  3A148170
08FD 0 3120      OC /3120      ERR IO          3A148180
08FE 0 4400 0FC4 G7C2 BSI L F005      CK LOCK ON ERROR  3A148190
0900 0 70E8      MOX A7C0      LOOP            3A148200
0901 0 C03E      *****
0902 0 A030      A7C4 LO N7C4      LD /FFFF      3A148210
0903 0 4C18 0C08 M N7C4      M /FFFF      3A148220
0905 0 4400 0F69 BSC L G7C4,E-  BRANCH ON ZERO      3A148230
0905 0 4400 0F69 BSI L F000      M /FFFFX/FFFF ACC FAILED 3A148240
```

```
0C07 0 3121      DC /3121      ERR IO          3A148300
0C08 0 4400 0F98 G7C4 BSI L F00E      CK LOCK ON ERROR  3A148310
0C0A 0 70F6      MOX A7C4      LOOP            3A148320
0C0B 0 18D0      RTE 16      NOW A#/0001 Q#/0000  3A148330
0C0C 0 F034      EOR N7C5      ZERO WITH /0001  3A148340
0C0D 0 4C18 0C12 BSC L G7C6,E-  BRANCH ON ZERO      3A148350
0C0F 0 4400 0F69 BSI L F000      M /FFFFX/FFFF Q REG FAILED 3A148360
0C11 0 3122      OC /3122      ERR IO          3A148370
0C12 0 4400 0FC4 G7C6 BSI L F005      CK LOCK ON ERROR  3A148380
0C14 0 70EC      MOX A7C4      LOOP            3A148390
0C15 0 C02C      *****
0C16 0 A029      A7C8 LO N7C6      LO /0000      3A148400
0C17 0 4C18 0C1C M N7C4      M /FFFF      3A148410
0C19 0 4400 0F69 BSC L G7C8,E-  BRANCH ON ZERO      3A148420
0C1B 0 3123      BSI L F000      M /FFFFX/0000 ACC FAILED 3A148430
0C1C 0 4400 0F98 OC /3123      ERR IO          3A148440
0C1E 0 70F6      G7C8 BSI L F00E      CK LOCK ON ERROR  3A148450
0C1F 0 1800      MOX A7C8      LOOP            3A148460
0C20 0 4C18 0C25 RTE 16      NOW A#/0000 Q#/0000  3A148470
0C22 0 4400 0F69 BSC L G7CA,E-  BRANCH ON ZERO      3A148480
0C24 0 3124      BSI L F000      M /FFFFX/0000 Q REG FAILED 3A148490
0C25 0 4400 0FC4 DC /3124      ERR IO          3A148500
0C27 0 70E0      G7CA BSI L F005      CK LOCK ON ERROR  3A148510
0C28 0 C017      MOX A7C8      LOOP            3A148520
0C29 0 A018      *****
0C2A 0 4C18 0C2F A7CC LO N7C4      LO /FFFF      3A148530
0C2C 0 4400 0F69 M N7C6      M /0000      3A148540
0C2E 0 3125      BSC L G7CC,E-  BRANCH ON ZERO      3A148550
0C2F 0 4400 0F98 BSI L F000      M /0000X/FFFF ACC FAILED 3A148560
0C31 0 70F6      OC /3125      ERR IO          3A148570
0C32 0 1800      G7CC BSI L F00E      CK LOCK ON ERROR  3A148580
0C33 0 4C18 0C38 MOX A7CC      LOOP            3A148590
0C35 0 4400 0F69 RTE 16      NOW A#/0000 Q#/0000  3A148600
0C37 0 3126      BSC L G7CE,E-  BRANCH ON ZERO      3A148610
0C38 0 4400 0FC4 BSI L F000      M /0000X/FFFF Q REG FAILED 3A148620
0C3A 0 70ED      DC /3126      ERR IO          3A148630
0C3B 0 7007      G7CE BSI L F005      CK LOCK ON ERROR  3A148640
0C3C 0 5555      MOX A7CC      LOOP            3A148650
0C3D 0 2AAA      MOX A800      EXIT TO NEXT ROUTINE 3A148660
0C3E 0 0E38      N7C0 OC /5555      3A148670
0C3F 0 9C72      N7C1 OC /2AAA      3A148680
0C40 0 FFFF      N7C2 DC /0E38      3A148690
0C41 0 0001      N7C3 OC /9C72      3A148700
0C42 0 0000      N7C4 DC /FFFF      3A148710
0C43 0 0000      N7C5 OC /0001      3A148720
0C44 0 0000      N7C6 OC /0000      3A148730
```

TEST OF DIVIDE OPERATION

```
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS IO&SEQ# AT RIGHT
*****
0C43 0 2000      A800 LOS 0      SET C AND OF OFF  3A148800
0C44 0 CC00 0CE2 LOO L N802      LO A#/4000 Q#/7FFF  3A148810
0C46 0 AC00 0CF2 D L N812      0 /8000      3A148820
0C48 0 2C00 0CE1 STS L N800      STORE C AND OF CONDITION 3A148830
0C4A 0 F400 0CF2 EOR L N812      ZERO WITH /8000  3A148840
0C4C 0 4C18 0C51 BSC L G800,E-  BR ON ZERO        3A148850
0C4E 0 4400 0F69 BSI L F000      DVD-A-REG INCORRECT 3A148860
0C50 0 3127      OC /3127      ERR IO          3A148870
0C51 0 4400 0F98 G800 BSI L F00E      CK LOCK ON ERROR  3A148880
0C53 0 70EF      MOX A800      LOOP            3A148890
0C54 0 1800      RTE 16      NOW A#/7FFF Q#/0000  3A148900
0C55 0 F400 0CF1 EOR L N811      ZERO WITH /7FFF  3A148910
0C57 0 4C18 0C5C BSC L G802,E-  BRANCH ON ZERO      3A148920
0C59 0 4400 0F69 BSI L F000      DVD-Q REG INCORRECT 3A148930
```

OC5B 0 3128	DC	/3128	ERR ID	3A148980
OC5C 0 4400 OF98	G802 BSI L	F00E	CK LOCK ON ERROR	3A148990
OC5E 0 70E4	MDX	A800	LOOP	3A149000
OC5F 0 C0E2	LD	N7C6	LD /0000	3A149010
OC60 0 4C18 OC6E	BSC L	G804,E-	BRANCH ON ZERO	3A149020
OC62 0 4C04 OC6B	BSC L	H804,E	BR ON NOT EVEN	3A149030
OC64 0 4400 OF69	BSI L	F000	CARRY ON	3A149040
OC66 0 3129	DC	/3129	ERR ID	3A149050
OC67 0 4400 OFC4	BSI L	F005	CK LOCK ON ERRDR	3A149060
OC69 0 70D9	MDX	A800	LOOP	3A149070
OC6A 0 7006	MDX	A806	EXIT TO NEXT ROUTINE	3A149080
OC6B 0 4400 OF69	H804 BSI L	F000	OVFLO ON	3A149090
OC6D 0 312A	DC	/312A	ERR ID	3A149100
OC6E 0 4400 OFC4	G804 BSI L	F005	CK LOCK ON ERROR	3A149110
OC70 0 70D2	MDX	A800	LDDP	3A149120

OC71 0 C872	A806 LDD	N804	LD A#/1C71 Q#/B8E3	3A149130
OC72 0 AC00 OCF3	D L	N813	D /5555	3A149140
OC74 0 286C	STS	N800	STORE C AND OF CONOITION	3A149150
OC75 0 F07D	EDR	N813	ZERD WITH /55555	3A149160
OC76 0 4C18 OC7B	BSC L	G806,E-	BRANCH ON ZERO	3A149170
OC78 0 4400 OF69	BSI L	F000	DVD-A REG INCORRECT	3A149180
OC7A 0 312B	DC	/312B	ERR ID	3A149190
OC7B 0 4400 OF98	G806 BSI L	F00E	CK LOCK ON ERROR	3A149200
OC7D 0 70F3	MDX	A806	LOOP	3A149210
OC7E 0 18D0	RTE	16	NOW A#/B8E3 Q#/0000	3A149220
OC7F 0 F074	EDR	N816	ZERD WITH /20AA	3A149230
OC80 0 4C18 OC85	BSC L	G808,E-	BRANCH ON ZERO	3A149240
OC82 0 4400 OF69	BSI L	F000	OVD-Q REG INCORRECT	3A149250
OC84 0 312C	DC	/312C	ERR ID	3A149260
OC85 0 4400 OF98	G808 BSI L	F00E	CK LOCK ON ERRDR	3A149270
OC87 0 70E9	MDX	A806	LOOP	3A149280
OC88 0 C058	LD	N800	LD C AND OF CONOITION	3A149290
OC89 0 4C18 OC97	BSC L	G80A,E-	BRANCH ON ZERO	3A149300
OC8B 0 4C04 OC94	BSC L	H80A,E	BR IF NOT EVEN	3A149310
OC8D 0 4400 OF69	BSI L	F000	CARRY ON	3A149320
OC8F 0 312D	DC	/312D	ERR ID	3A149330
OC90 0 4400 OFC4	BSI L	F005	CK LOCK ON ERROR	3A149340
OC92 0 70DE	MDX	A806	LOOP	3A149350
OC93 0 7006	MDX	A80C	EXIT TO NEXT ROUTINE	3A149360
OC94 0 4400 OF69	H80A BSI L	F000	OVFLO ON	3A149370
OC96 0 312E	DC	/312E	ERR ID	3A149380
OC97 0 4400 OFC4	G80A BSI L	F005	CK LOCK ON ERROR	3A149390
OC99 0 70D7	MDX	A806	LOOP	3A149400

COPE DATA OR	*LA- OPER-			3A149410
A00R INSTRUCTION	*BEL ATION FT DPERANOS & REMARKS	ID&SEQ# AT RIGHT		3A149420

OC9A 0 2000	A80C LOS	0	SET C AND OF OFF	3A149430
OC9B 0 C84A	LOD	N806	SET A#/0000 Q#/0001	3A149440
OC9C 0 A851	O	N80E	D /0000	3A149450
OC9D 0 4C01 OCA2	BSC L	G80C,D	BRANCH ON OVERFLOW	3A149460
OC9F 0 4400 OF69	H80C BSI L	F000	OYO BY 0- OFL OFF	3A149470
OCA1 0 312F	DC	/312F	ERR ID	3A149480
OCA2 0 4400 OFC4	G80C BSI L	F005	CK LOCK ON ERROR	3A149490
OCA4 0 70F5	MDX	A80C	LOOP	3A149500
OCA5 0 18D0	RTE	16	SWAP A AND Q	3A149510
OCA6 0 F040	EDR	N807	ACC S/8 /0000	3A149520
OCA7 0 4C20 OC9F	BSC L	H80C,Z	BCH UNLESS ZERO	3A149530

OCA9 0 2000	A80E LDS	0	SET C AND OF OFF	3A149540
OCAA 0 C83D	LDO	N808	LD A#/4000 Q#/0000	3A149550
OCA8 0 A83B	O	N807	D /0001	3A149560
OCA9 0 4C01 OCB1	BSC L	G80E,D	BRANCH ON OVERFLOW	3A149570
OCAE 0 4400 OF69	BSI L	F000	DVD-BY 1-OVRFLW OFF	3A149580
OCB0 0 3130	DC	/3130	ERR ID	3A149590
OCB1 0 4400 OFC4	G80E BSI L	F005	CK LOCK ON ERROR	3A149600

OCB3 0 70F5	MOX	A80E	LDDP	3A149660

OCB4 0 2000	B800 LDS	0	SET C AND OF DFF	3A149670
OCB5 0 C834	LDD	N80A	LD A#/A000 Q#/0000	3A149680
OCB6 0 A831	D	N808	D /4000	3A149690
OCB7 0 4C01 OCBC	BSC L	J800,D	BRANCH ON OVERFLOW	3A149700
OCB9 0 4400 OF69	BSI L	F000	DVD/4000-OVRFLW OFF	3A149710
OCB8 0 3131	DC	/3131	ERR ID	3A149720
OCBC 0 4400 OFC4	J800 BSI L	F005	CK LOCK ON ERRDR	3A149730
OCBE 0 70F5	MDX	B800	LDDP	3A149740

OCBF 0 2000	B802 LDS	0	SET C AND OF DFF	3A149750
OCCE 0 C82B	LDD	N80C	LD A#/C000 Q#/0000	3A149760
OCCE 0 A830	D	N812	D /8000	3A149770
OCCE 0 4C01 OCC7	BSC L	J802,D	BR ON DF	3A149780
OCCE 0 4400 OF69	BSI L	F000	DVD/8000-OVRFLW OFF	3A149790
OCCE 0 3132	DC	/3132	ERR ID	3A149800
OCCE 0 4400 OFC4	J802 BSI L	F005	CHECK LDDP SWITCH	3A149810
OCCE 0 70F5	MDX	B802	LOOP	3A149820

OCCE 0 2000	B804 LDS	0	SET C AND OF DFF	3A149830
OCCE 0 C822	LDD	N80E	LD A#/0000 Q#/FFFF	3A149840
OCCE 0 A81A	D	N807	D /0001	3A149850
OCCE 0 4C01 OCD2	BSC L	J804,D	BR ON DF	3A149860
OCCE 0 4400 OF69	BSI L	F000	DVD/0001-OVRFLW OFF	3A149870
OCCE 0 3133	DC	/3133	ERR ID	3A149880
OCCE 0 4400 OFC4	J804 BSI L	F005	CK LOCK ON ERROR	3A149890
OCCE 0 70F5	MDX	B804	LDDP	3A149900

OCCE 0 2000	B806 LDS	0	SET C AND OF DFF	3A149910
OCCE 0 C819	LDD	N810	LD A#/FFFF Q#/7FFF	3A149920
OCCE 0 A80F	D	N807	D /0001	3A149930
OCCE 0 4C01 OCDD	BSC L	J806,D	BR ON DF	3A149940
OCCE 0 4400 OF69	BSI L	F000	DVD/0001-OVRFLW OFF	3A149950
OCCE 0 3134	DC	/3134	ERR ID	3A149960
OCCE 0 4400 OFC4	J806 BSI L	F005	CK LOCK ON ERROR	3A149970
OCCE 0 70F5	MOX	B806	LDDP	3A149980
OCCE 0 7023	MOX	B807	EXIT TO NEXT ROUTINE	3A149990
OCCE 0 0000	N800 DC	/0000	STORAGE	3A150000
OCCE 0 0000	BSS E			3A150010
OCCE 0 4000	N802 OC	/4000		3A150020
OCCE 0 7FFF	DC	/7FFF		3A150030
OCCE 0 1C71	N804 OC	/1C71		3A150040
OCCE 0 B8E3	DC	/B8E3		3A150050
OCCE 0 0000	N806 OC	/0000		3A150060
OCCE 0 0001	N807 OC	/0001		3A150070
OCCE 0 4000	N808 OC	/4000		3A150080
OCCE 0 0000	OC	/0000		3A150090
OCCE 0 A000	N80A OC	/A000		3A150100
OCCE 0 0000	OC	/0000		3A150110
OCCE 0 C000	N80C DC	/C000		3A150120
OCCE 0 0000	OC	/0000		3A150130
OCCE 0 0000	N80E OC	/0000		3A150140
OCCE 0 FFFF	N80F OC	/FFFF		3A150150
OCCE 0 FFFF	N810 OC	/FFFF		3A150160
OCCE 0 7FFF	N311 OC	/7FFF		3A150170
OCCE 0 8000	N812 OC	/8000		3A150180
OCCE 0 5555	N813 OC	/5555		3A150190
OCCE 0 20AA	N816 OC	/20AA		3A150200
OCCE 0 C000	N817 OC	/C000		3A150210
OCCE 0 6100	N818 OC	/6100		3A150220
OCCE 0 0000	DC	/0000		3A150230
OCCE 0 8000	N819 OC	/8000		3A150240
OCCE 0 0000	OC	/0000		3A150250
OCCE 0 0002	N820 OC	/0002		3A150260
OCCE 0 0000	N821 OC	0		3A150270
OCCE 0 2001	OC	/2001		3A150280
OCCE 0 4000	CC	/4000		3A150290

CPU FUNCTION TEST

```
OCFF 0 C000      DC      /C000      3A150340
OD00 0 0000      BSS E 0      3A150350
OD00 0 FFFF      N823 DC      /FFFF      3A150360
OD01 0 FFFF      OC      /FFFF      3A150370
OD02 0 0000      N824 DC      0      STORAGE 3A150380
OD03 0 0000      OC      0      STORAGE 3A150390
*****
*****
COKE DATA DR *LA- DPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT 3A150430
*****
OD04 0 2000      8807 LDS      0      SET C AND OF OFF 3A150440
OD05 0 C8F0      LOD      N818      LD A#/6100 Q#/0000 3A150450
OD06 0 A8EE      D      N817      D /C000 3A150460
OD07 0 4C01 OD0C BSC L J808,0 BR ON OF 3A150470
OD09 0 4400 OF69 BSI L F000 OVERFLOW OFF 3A150480
OD08 0 316A      DC      /316A ERR ID 3A150490
OC0C 0 4400 OFC4 J808 BSI L F005 CK LOCK ON ERROR 3A150500
OD0E 0 70F5      MDX      8807 LOOP 3A150510
*****
OD0F 0 2000      8808 LOS      0      SET C AND OF OFF 3A150520
OD10 0 C8E7      LOD      N819      LD A#/8000 Q#/0000 3A150530
OD11 0 A8DD      D      N80F      D /FFFF 3A150540
OD12 0 4C01 OD17 BSC L J809,0 BR ON OF 3A150550
OD14 0 4400 OF69 BSI L F000 OVERFLOW OFF 3A150560
OD16 0 3168      DC      /3168 ERR ID 3A150570
OD17 0 4400 OFC4 J809 BSI L F005 CK LOCK ON ERROR 3A150580
OD19 0 70F5      MDX      8808 LOOP 3A150590
*****
OD1A 0 2000      8809 LOS      0      SET C AND OF OFF 3A150600
OD18 0 C8E4      LOD      N823      LD A#/FFFF Q#/FFFF 3A150610
OD1C 0 A8DD      D      N820      D /0002 3A150620
OD1D 0 4C01 OD20 BSC L J815,0 BR ON OF 3A150630
OD1F 0 7003      MDX      J810 OVERFLOW OFF 3A150640
OD20 0 4400 OF69 J815 BSI L F000 CK LOCK ON ERROR 3A150650
OD22 0 316C      DC      /316C ERR ID 3A150660
OD23 0 4400 OFC4 J810 BSI L F005 CK LOCK ON ERROR 3A150670
OD25 0 70F4      MDX      8809 LOOP 3A150680
*****
*****
*
* MULTIPLY-DIV TEST 8810# 3A150690
*
* THIS TEST TAKES 4 NUMBERS 3A150700
* /8000, /C000, /4000 AND 3A150710
* /2001 AND MULTIPLIES AND 3A150720
* DIVIDES THE RESULT OF THE 3A150730
* MULTIPLICATION BY ALL 3A150740
* VALUES OF NEGATIVE AND 3A150750
* POSITIVE NUMBERS. THIS 3A150760
* PROCEDURE IS REPETED 3A150770
* UNTIL ALL FOUR NUMBERS 3A150780
* HAVE BEEN USED. 3A150790
*
* STEP1 SET MULTIPLICAND AND 3A150800
* DIVISOR TO LARGEST NEG. 3A150810
* NUMBER. 3A150820
* STEP2 TAKE ONE OF FOUR NUMBERS 3A150830
* AND USE IT AS THE 3A150840
* MULTIPLIER 3A150850
* STEP3 MULTIPLY 3A150860
* STEP4 STORE RESULTS IN SYMBOLIC 3A150870
* LOCATION N824 3A150880
* STEP5 DIVIDE 3A150890
* STEP6 CHECK RESULT 3A150900
* STEP7 INCREMENT MULTIPLICAND 3A150910
* 3A150920
* 3A150930
* 3A150940
* 3A150950
* 3A150960
* 3A150970
* 3A150980
* 3A150990
* 3A151000
* 3A151010
```

CPU FUNCTION TEST

```
* AND DIVISOR BY 1. 3A151020
* STEP8 GO TO STEP 2 IF ALL 3A151030
* VALUES HAVE NOT BEEN 3A151040
* USED AS MULTIPLICANDS AND 3A151050
* DIVISORS. 3A151060
* STEP9 SET UP FOR NEXT ONE OF 4 3A151070
* MULTIPLIERS. 3A151080
* STEP10 GO TO STEP 2 IF ALL 4 3A151090
* NUMBERS HAVE NOT BEEN 3A151100
* USED. 3A151110
* 3A151120
* 3A151130
* 3A151140
* NOTE -- THREE WORD LOCATIONS ARE AVAILABLE FOR 3A151150
* MANUAL INSERTION OF ANY VALUE DESIRED. 3A151160
* THEY ARE AT LABEL ADDRESS N821&1, N821&2, 3A151170
* AND N821&3. 3A151180
* 3A151190
* CAUTION ** DO NOT CHANGE THE WORD AT LABEL 3A151200
* LOCATION N822 & /8000#. 3A151210
* 3A151220
*****
CDRE DATA DR *LA- OPER-
ADDR INSTRUCTION *BEL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT 3A151230
*****
OD26 0 6104      B810 LDX      1 4      LO XR 1 WITH /0004 3A151240
OD27 0 0C00 OFD2 J814 XIO L F003 CK BYPASS MPY/DIV SW 3A151250
OD29 0 C400 OF05 LD L Z000 LO SWITCH SETTINGS 3A151260
OD28 0 1808      SRA      8      SHIFT BIT 7 TO BIT PDS 15 3A151270
OD2C 0 4804      BSC      E      SK IF BIT 15#0 3A151280
OD2D 0 7028      MDX      A840 SW BIT 6 ON 8BYPASS# 3A151290
OD2E 0 C0C9      LD      N819 CDNST /8000 3A151300
OD2F 0 D0C8      STO      N821 STORE /8000 AT N821 3A151310
OD30 0 C0CA      J811 LO      N821 LD C&N821# /8000 3A151320
OD31 0 A500 OCF8 M L1 N821 3A151330
OD33 0 08CE      STO      N824 STORE A AND Q 3A151340
OD34 0 2000      LOS      0      SET C AND OF OFF 3A151350
OD35 0 A8C5      D      N821 D /8000 3A151360
OD36 0 F500 OCF8 EOR L1 N821 ZERO WITH /8000 3A151370
OD38 0 4C18 OD3D BSC L J812,&- BRANCH ON ZERO 3A151380
OD3A 0 4400 OF69 BSI L F000 ACC NOT ZERO 3A151390
OD3C 0 316D      OC      /316D ERR ID 3A151400
OD3D 0 4400 OF98 J812 BSI L F00E CK LOCK ON ERROR 3A151410
OD3F 0 70F0      MDX      J811 LDOP ON MPL/DIV 3A151420
OD40 0 1800      RTE      16 NOW A#/0000 Q#/0000 3A151430
OD41 0 4C18 OD46 BSC L J813,&- BRANCH ON ZERO 3A151440
OD43 0 4400 OF69 BSI L F000 REMAINDER IN Q REG 3A151450
OD45 0 316E      DC      /316E ERR ID 3A151460
OD46 0 4400 OF98 J813 BSI L F00E CK LOCK ON ERROR 3A151470
OD48 0 70E7      MDX      J811 LDOP ON MPL/DIV 3A151480
OD49 0 C081      J816 LD      N821 LD /8000 3A151490
OD4A 0 809C      A      N807 AOD ONE 3A151500
OD48 0 00AF      STO      N821 3A151510
OD4C 0 4C18 OD49 BSC L J816,&- BRANCH ON ZERO 3A151520
OD4E 0 F0A9      EOR      N819 3A151530
OD4F 0 4C20 OD30 BSC L J811,2 BR IF NOT ZERO 3A151540
OD51 0 71FF      MDX      1 -1 3A151550
OD52 0 70D4      MOX      J814 LDOP TO CK SWITCHES 3A151560
OD53 0 4400 OFC4 BSI L F005 CK LOCK ON ERROR 3A151570
OD55 0 70D0      MDX      8810 LOOP 3A151580
*****
* TEST OF MDX OPERATION 3A151590
* 3A151600
* 3A151610
* 3A151620
* 3A151630
* 3A151640
* 3A151650
* 3A151660
* 3A151670
* 3A151680
* 3A151690
OD56 0 6100      A840 LOX      1 0      LD XR 1 WITH ZERO
OD57 0 71FF      MOX      1 -1      SK IF SIGN CHANGES
OD58 0 3000      WAIT 3A151690
```


CORE	DATA OR ADDRESS	INSTRUCTION	LA- OPER- *BEL ATION	FT OPERANDS & REMARKS	105EQ# AT RIGHT
0059	0	6600	STX	1 N840	STORE CXXR 10 AT N840
005A	0	C06C	LO	N840	LD VALUE OF XR 1
005B	0	F06C	EOR	N841	ZERO ACC WITH /FFFF
005C	0	4C18 0061	BSC	L G840, E-	BRANCH ON ZERO
005E	0	4400 0F69	BSI	L F000	MOX XR 1 FAILED
0060	0	3135	OC	/3135	ERR 10
0061	0	4400 0FC4	G840 BSI	L F005	CK LOCK ON ERROR
0063	0	70F2	MDX	A840	LOOP

0064	0	C068	A842	LO N845	LO WITH ADDR OF

0065	0	7401 0DC9	MOX	L N842, 1	BR TO LABEL ADOR N842 & 1
0067	0	F065	EOR	N845	
0068	0	4C18 0D6D	BSC	L N842, E-	BRANCH ON ZERO
006A	0	4400 0F69	BSI	L F000	ACC OISTROYED AFTER MDX
006C	0	316F	OC	/316F	ERR 10
0060	0	C058	H842	LO N842	LO A# /3000
006E	0	F05F	EOR	N846	ACC NOW /0001
006F	0	4C18 0074	BSC	L G842, E-	BRANCH ON ZERO
0071	0	4400 0F69	BSI	L F000	ADD TO MEM FAILED
0073	0	3136	OC	/3136	ERR 10
0074	0	C056	G842	LO N843	LO /3000
0075	0	D053	STO	N842	
0076	0	4400 0FC4	BSI	L F005	CK LOCK ON ERROR
0078	0	70E8	MOX	A842	LOOP

0079	0	6600 FFFE	A844	LOX L2 -2	LD XR 2 WITH -2
0078	0	7600 0001	MOX	L2 1	ADD ONE TO XR 2
0070	0	6A49	STX	2 N840	STORE XR 2
007E	0	C048	LO	N840	LD WITH XR 2 VALUE
007F	0	F048	EOR	N841	ZERO ACC WITH /FFFF
0080	0	4C18 0D85	BSC	L G844, E-	BRANCH ON ZERO
0082	0	4400 0F69	BSI	L F000	MOX LONG XR 2 FAILED
0084	0	3137	OC	/3137	ERR 10
0085	0	4400 0FC4	G844	BSI L F005	CK LOCK ON ERROR
0087	0	70F1	MDX	A844	LOOP

0088	0	63FF	A846	LOX 3 -1	LO XR 3 WITH -1
0089	0	7301	MDX	3 1	ADD ONE TO XR 3
008A	0	7001	MDX	G846	OID NOT SK ON MDX
0088	0	7003	MOX	H846	
008C	0	4400 0F69	G846	BSI L F000	XR 3 NO SKIP AT 0
008E	0	3138	DC	/3138	ERR 10
008F	0	4400 0FC4	H846	BSI L F005	CK LOCK ON ERROR
0091	0	70F6	MDX	A846	LOOP

0092	0	61FF	A848	LDX 1 -1	LO XR 1 WITH -1
0093	0	7104	MDX	1 4	ADD 4 TO XR 1
0094	0	7001	MOX	G848	OID NOT SK ON MOX
0095	0	7003	MDX	H848	
0096	0	4400 0F69	G848	BSI L F000	SIGN CHANGE-NO SKIP
0098	0	3139	OC	/3139	ERR 10
0099	0	4400 0FC4	H848	BSI L F005	CK LOCK ON ERROR
0098	0	70F6	MOX	A848	LOOP

009C	0	6500 FFFE	A849	LOX L1 -2	LO XR 1 WITH -2
009E	0	C0FF	H849	LO H849	
009F	0	7580 00C0	MOX	11 N845	
00A1	0	6925	STX	1 N840	STORE CXXR 10 AT N840
00A2	0	F0F8	EOR	H849	
00A3	0	4C18 00A8	BSC	L K849, E-	BRANCH ON ZERO
00A5	0	4400 0F69	BSI	L F000	ACC GONE AFTER MDX INDEXED
00A7	0	3168	OC	/3168	ERR 10
00A8	0	C01E	K849	LO N840	LO VALUE OF XR 1 AFTER

OATE	02JAN66	01MAY66	15NOV66	15FE868	26AUG68	PROG 10	03A1-1
EC NO.	415490	415490C	419643	420403	420403A	PAGE	39

		*	* MDX OP	3A152380
ODAA 0 F01E	EOR	N841	ZERO ACC WITH /FFFF	3A152390
ODAA 0 4C18 ODAF	BSC L	G849,&-	BRANCH ON ZERO	3A152400
ODAC 0 4400 OF69	BSI L	F000	INDIRECT MDX FAILED	3A152410
ODAE 0 313A	DC	/313A	ERR ID	3A152420
ODAF 0 4400 OFC4	BSI L	F005	CK LOCK ON ERROR	3A152430
ODB1 0 70EA	MDX	A849	LOOP	3A152440
	*****			3A152450
0082 0 7400 OOC6	A84A MOX L	N84A,0	TEST SKIP IF ZERO	3A152460
ODB4 0 7001	MDX	G84A	8YPASS IF CORRECT OP	3A152470
ODB5 0 7003	MOX	H84A		3A152480
OD86 0 4400 OF69	G84A BSI L	F000	MOX L FAILED TO SKIP	3A152490
OD88 0 3171	DC	/3171	ERR ID	3A152500
ODB9 0 4400 OFC4	H84A BSI L	F005	CK LOCK ON ERRDR	3A152510
OD88 0 70F6	MOX	A84A	LOOP	3A152520
	*****			3A152530
008C 0 7400 OOC C	A85A MDX L	N844,0	TEST NON SKIP	3A152540
OD8E 0 7003	MOX	H85A		3A152550
OD8F 0 4400 OF69	BSI L	F000	MDX L SKIPED	3A152560
OOC1 0 3172	DC	/3172	ERR IO	3A152570
OOC2 0 4400 OFC4	H85A BSI L	F005	CK LOCK ON ERROR	3A152580
OOC4 0 70F7	MDX	A85A	LOOP	3A152590
ODC5 0 7009	MOX	A880	EXIT TO NEXT ROUTINE	3A152600
ODC6 0 0000	N84A DC	0	CONSTANT ZERO	3A152610
	*****			3A152620
CORE DATA DR	*LA- OPER-			3A152630
AODR INSTRUCTION	*BEL ATION FT OPERANOS & REMARKS	IDCSEQ# AT RIGHT		3A152640
*****				3A152650
ODC7 0 0000	N840 DC	/0000	STORAGE	3A152660
ODC8 0 FFFF	N841 DC	/FFFF		3A152670
ODC9 0 3000	N842 WAIT		ADD TO MEM FAILED	3A152680
ODCA 0 3000	WAIT		ADD TO MEM FAILED	3A152690
ODCB 0 3000	N843 WAIT		ADD TO MEM FAILED	3A152700
ODCC 0 0001	N844 OC	/0001		3A152710
ODCD 0 ODCC	N845 OC	N844		3A152720
ODCE 0 3001	N846 OC	/3001		3A152730
	*			3A152740
	*		TEST OF SLC OPERATION	3A152750
	*			3A152760
	*****			3A152770
ODCF 0 610A	A880 LDX	1 10	LD XR 1 WITH &10	3A152780
ODD0 0 CC00 DEC8	LDD L	N882	LD A#/0000 Q#/FFFF	3A152790
ODD2 0 2002	LDS	2	SET C ON	3A152800
ODD3 0 1140	SLCA	1 0	NOW A#/0000 Q#/FFFF	3A152810
ODD4 0 6000 DEC7	STX LI	N880	STORE CXXR 10	3A152820
ODD6 0 2812	STS	G881	STORE CARRY CONOITION	3A152830
ODD7 0 4C18 ODDC	BSC L	G880,&-	BRANCH ON ZERO	3A152840
ODD9 0 4400 OF69	BSI L	F000	ACC NOT#ZERO	3A152850
ODD8 0 3138	OC	/3138	ERR IO	3A152860
ODDC 0 4400 OF98	G880 BSI L	F00E	CK LOCK ON ERROR	3A152870
ODEE 0 70F0	MOX	A880	LOOP	3A152880
ODEF 0 C400 DEC7	LO L	N880	LD PREVIOUS CXXR 10	3A152890
ODE1 0 4C18 ODE6	BSC L	G882,&-	BRANCH ON ZERO	3A152900
ODE3 0 4400 OF69	BSI L	F000	XR 1 NOT#ZERO	3A152910
ODE5 0 313C	OC	/313C	ERR IO	3A152920
ODE6 0 4400 OF98	G882 BSI L	F00E	CK LOCK ON ERROR	3A152930
ODE8 0 70E6	MDX	A880	LOOP	3A152940
ODE9 0 2000	G881 LDS	0	SAVED BY STS ABOVE	3A152950
ODEA 0 4802	BSC	C	SK IF CARRY OFF	3A152960
ODEB 0 7004	MOX	G883	CARRY ON	3A152970
ODEC 0 4400 OFC4	BSI L	F005	CK LOCK ON ERROR	3A152980
ODEE 0 70E0	MDX	A880	LOOP	3A152990
ODEF 0 7006	MOX	A884	EXIT TO NEXT ROUTINE	3A153000
ODFO 0 4400 OF69	G883 BSI L	F000	CARRY ON %SHOULD NOT BE0	3A153010
GDF2 0 3160	OC	/3160	ERR IO	3A153020
ODF3 0 4400 OFC4	BSI L	F005	CK LOCK ON ERROR	3A153030
ODF5 0 70D9	MDX	A880	LOOP	3A153040

OATE	02JAN66	01MAY66	15NOV66	15FEB68	26AUG68	PROG 10	03A1-1
EC NO.	415490	415490C	419643	420403	420403A	PAGE	39A

```
*****
ODF6 0 6580 OECO A884 LOX 11 N887 LO XR 1 WITH /FFD0 3A153060
ODF8 0 CC00 OECA LDD L N884 LO A#/0001 Q#/0010 3A153070
ODFA 0 2000 LDS O SET C AND OF OFF 3A153080
ODF8 0 1140 SLCA 1 O ACC NOW /8000 3A153090
ODFC 0 2818 STS G885 STORE C AND OF CONDITION 3A153100
ODFD 0 F400 OECC EOR L N886 ZERO WITH /8000 3A153110
ODFF 0 4C18 OE04 8SC L G884,&- BRANCH ON ZERO 3A153120
OE01 0 4400 OF69 8SI L F000 ACC NOT#/8000 3A153130
OE03 0 313D OC /313D ERR IO 3A153140
OE04 0 4400 OF98 G884 8SI L F00E CHECK LOOP SWITCH 3A153150
OE06 0 70EF MDX A884 LOOP 3A153160
OE07 0 6D00 OEC7 STX L1 N880 STORE C&XR 1# AT N880 3A153170
OE09 0 F400 OEC7 LO L N880 LO C&N880# 3A153180
OE08 0 F400 OE04 EOR L N88E ZERO WITH /FF01 3A153190
OE0D 0 4C18 OE12 8SC L G866,&- BRANCH ON ZERO 3A153200
OE0F 0 4400 OF69 8SI L F000 XR-1 NOT FF01 3A153210
OE11 0 313E DC /313E ERR IO 3A153220
OE12 0 4400 OF98 G886 8SI L F00E CK LOCK ON ERROR 3A153230
OE14 0 70E1 MOX A884 LOOP 3A153240
OE15 0 2000 G885 LDS O SAVED BY STS ABOVE 3A153250
OE16 0 4802 8SC C SK IF CARRY OFF 3A153260
OE17 0 7003 MDX G887 CARRY OFF, SHOULD BE ON 3A153270
OE18 0 4400 OF69 8SI L F000 ERR IO 3A153280
OE1A 0 3161 DC /3161 ERR IO 3A153290
OE18 0 4400 OFC4 G887 8SI L F005 CK LOCK ON ERROR 3A153300
OE10 0 70D8 MDX A884 LOOP 3A153310
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *8EL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
OE1E 0 6580 OEC8 A888 LDX 11 N885 LO XR 1 WITH /0010 3A153320
OE20 0 CC00 OECC LDO L N886 LO A# /8000 Q#/FF00 3A153330
OE22 0 1140 SLCA 1 O ACC NOW /8000 3A153340
OE23 0 F400 OECC EOR L N886 ZERO WITH /8000 3A153350
OE25 0 4C18 OE2A 8SC L G888,&- BRANCH ON ZERO 3A153360
OE27 0 4400 OF69 8SI L F000 ACC NOT#8000 3A153370
OE29 0 313F OC /313F ERR IO 3A153380
OE2A 0 4400 OF98 G888 8SI L F00E CK LOCK ON ERROR 3A153390
OE2C 0 70F1 MDX A888 LOOP 3A153400
OE20 0 6D00 OEC7 STX L1 N880 STORE C&XR 1# IN N880 3A153410
OE2F 0 C400 OEC7 LD L N880 LO C&N880# 3A153420
OE31 0 F400 OEC8 EOR L N885 ZERO WITH /0010 3A153430
OE33 0 4C18 OE38 8SC L G88A,&- BRANCH ON ZERO 3A153440
OE35 0 4400 OF69 8SI L F000 XR 1 NOT#0010 3A153450
OE37 0 3140 DC /3140 ERR IO 3A153460
OE38 0 4400 OFC4 G88A 8SI L F005 CK LOCK ON ERROR 3A153470
OE3A 0 70E3 MDX A888 LOOP 3A153480
*****
OE38 0 6110 A889 LOX 1 16 LO XR 1 WITH /0010 3A153490
OE3C 0 6210 LOX 2 16 LO XR 2 WITH /0010 3A153500
OE30 0 6310 LDX 3 16 LO XR 3 WITH /0010 3A153510
OE3E 0 C400 OECA LD L N884 LO A#/0001 3A153520
OE40 0 1041 SLCA 1 ACC NOW /0002 3A153530
OE41 0 F400 OE01 EOR L N888 ZERO WITH /0002 3A153540
OE43 0 4C18 OE48 8SC L G889,&- BRANCH ON ZERO 3A153550
OE45 0 4400 OF69 8SI L F000 NON INDEXEO SLCA FAILED 3A153560
OE47 0 3162 DC /3162 ERR IO 3A153570
OE48 0 4400 OFC4 G889 8SI L F005 CK LOCK ON ERROR 3A153580
OE4A 0 70F0 MDX A889 LOOP 3A153590
*****
OE48 0 6110 A88A LOX 1 16 LO XR 1 WITH /0010 3A153600
OE4C 0 6210 LDX 2 16 LO XR 2 WITH /0010 3A153610
OE4D 0 6310 LDX 3 16 LO XR 3 WITH /0010 3A153620
OE4E 0 CC00 OEC8 LOO L N882 LO A#/0000 Q#/FFFF 3A153630
OE50 0 10CF SLC 15 NOW A#/7FFF Q#/1000 3A153640
OE51 0 F400 OE05 EOR L N88F ZERO WITH /7FFF 3A153650
*****
```

```
OE53 0 4C18 OE56 8SC L G888,&- NDN INDEXEO SLC FAILED 3A153740
OE55 0 3173 OC /3173 ERR IO 3A153750
OE56 0 4400 OFC4 G888 8SI L F005 CK LOCK ON ERROR 3A153760
OE58 0 70F2 MOX A88A LOOP 3A153770
*****
OE59 0 6580 OE02 A88C LDX 11 N88C LO XR 1 WITH /0020 3A153780
OE58 0 C872 LDD N888 LO A#/0000 Q#/0000 3A153790
OE5C 0 11C0 SLC 1 O ACC NOW A#/0000 Q#/0000 3A153800
OE50 0 4C18 OE62 8SC L G88C,&- BRANCH ON ZERO 3A153810
OE5F 0 4400 OF69 8SI L F000 ACC NOT#0000 3A153820
OE61 0 3141 DC /3141 ERR IO 3A153830
OE62 0 4400 OF98 G88C 8SI L F00E CK LOCK ON ERROR 3A153840
OE64 0 70F4 MDX A88C LOOP 3A153850
OE65 0 1800 RTE 16 ACC NOW A#/0000 Q#/0000 3A153860
OE66 0 4C18 OE68 8SC L G88E,&- BRANCH ON ZERO 3A153870
OE68 0 4400 OF69 8SI L F000 Q REG NDT#0000 3A153880
OE6A 0 3142 OC /3142 ERR IO 3A153890
OE68 0 4400 OF98 G88E 8SI L F00E CK LOCK ON ERROR 3A153900
OE6D 0 70E8 MDX A88C LOOP 3A153910
OE6E 0 6958 STX 1 N880 STORE C&XR 1# IN N880 3A153920
OE6F 0 C057 LD N880 LO C&N880# 3A153930
OE70 0 4C18 OE75 8SC L J880,&- BRANCH ON ZERO 3A153940
OE72 0 4400 OF69 8SI L F000 XR 1 NDT#0000 3A153950
OE74 0 3143 OC /3143 ERR IO 3A153960
OE75 0 4400 OFC4 J880 8SI L F005 CK LOCK ON ERROR 3A153970
OE77 0 70E1 MDX A88C LOOP 3A153980
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *8EL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
OE78 0 6580 OED3 8882 LOX 11 N88D LO XR 1 WITH /FF0F 3A154010
OE7A 0 C855 LDO N88A LO A#/0000 Q#/0002 3A154020
OE7B 0 11C0 SLC 1 O NOW A#/8000 Q#/0000 3A154030
OE7C 0 F04F EOR N886 ZERO WITH /8000 3A154040
OE7D 0 4C18 OE82 8SC L J882,&- BRANCH ON ZERO 3A154050
OE7F 0 4400 OF69 8SI L F000 ACC NOT#/8000 3A154060
OE81 0 3144 DC /3144 ERR IO 3A154070
OE82 0 4400 OF98 J882 8SI L F00E CK LOCK ON ERROR 3A154080
OE84 0 70F3 MDX 8882 LOOP 3A154090
OE85 0 18D0 RTE 16 NOW A#/0000 Q#/8000 3A154100
OE86 0 4C18 OE88 8SC L J884,&- BRANCH ON ZERO 3A154110
OE88 0 4400 OF69 8SI L F000 Q REG NOT#0000 3A154120
OE8A 0 3145 DC /3145 ERR IO 3A154130
OE88 0 4400 OF98 J884 8SI L F00E CK LOCK ON ERROR 3A154140
OE8D 0 70EA MDX 8882 LOOP 3A154150
OE8E 0 6938 STX 1 N880 STORE C&XR 1# AT N880 3A154160
OE8F 0 C037 LD N880 LO C&N880# 3A154170
OE90 0 F400 OE04 EOR L N88E ZERO WITH /FF01 3A154180
OE92 0 4C18 OE97 8SC L J886,&- BRANCH ON ZERO 3A154190
OE94 0 4400 OF69 8SI L F000 XR-1 NOT FF01 3A154200
OE96 0 3146 DC /3146 ERR IO 3A154210
OE97 0 4400 OFC4 J886 8SI L F005 CK LOCK ON ERROR 3A154220
OE99 0 70DE MDX 8882 LOOP 3A154230
*****
OE9A 0 C835 8884 LDX N88A LO A#/0000 Q#/0002 3A154240
OE9B 0 611F LDX 1 31 LO XR 1 WITH /001F 3A154250
OE9C 0 11C0 SLC 1 O NOW A#/8000 Q#/0000 3A154260
OE9D 0 4802 8SC C SK IF CARRY OFF 3A154270
OE9E 0 7003 MDX J887 CARRY ON 3A154280
OE9F 0 4400 OF69 8SI L F000 CARRY NOT ON 3A154290
OE01 0 3147 OC /3147 ERR IO 3A154300
OE02 0 4400 OF98 J887 8SI L F00E CK LOCK ON ERROR 3A154310
OE04 0 70F5 MDX 8884 LOOP 3A154320
OE05 0 F026 EOR N886 ZERO WITH /8000 3A154330
OE06 0 4C18 OE08 8SC L J888,&- BRANCH ON ZERO 3A154340
OE08 0 4400 OF69 8SI L F000 ACC NOT EQUAL 8000 3A154350
*****
```

CPU FUNCTION TEST

```
OEAA 0 3148      DC      /3148      ERR ID      3A154420
OEAB 0 4400 OF98 J888 8S1 L F00E      CK LOCK ON ERROR 3A154430
OEAD 0 70EC      MDX      8884      LOOP      3A154440
OEAE 0 6D00 OEC7      STX L1 N880      STORE XR 1 WITH C#N880 3A154450
OEB0 0 C016      LD      N880      LD C#N880 3A154460
OEB1 0 F018      EOR      N884      ZERO WITH /0001 3A154470
OEB2 0 4C18 OEB7      BSC L J889,6- BRANCH ON ZERO 3A154480
OEB4 0 4400 OF69      8S1 L F000      XR 1 NOT EQUAL 0001 3A154490
OEB6 0 3149      DC      /3149      ERR ID      3A154500
OEB7 0 4400 OFC4 J889 8S1 L F005      CK LOCK ON ERROR 3A154510
OEB9 0 70E0      MDX      8884      LOOP      3A154520
*****
OEB8 0 611C      B885 LDX 1 28      LO XR 1 WITH /001C 3A154530
OEBB 0 C814      LDD      N88A      LD A#/0000 Q#/0002 3A154540
OEBD 0 1100      SLA 1 0      NOW A#/2000 Q#/0000 3A154550
OEBE 0 4802      BSC C      SKIP IF CARRY OFF 3A154560
OEBF 0 7001      MDX      J88A      3A154570
OEBF 0 7003      MDX      J88B      3A154580
OEC0 0 4400 OF69 J88A 8S1 L F000      CARRY IS ON 3A154590
OEC2 0 314A      DC      /314A      ERR ID 3A154600
OEC3 0 4400 OFC4 J88B 8S1 L F005      CK LOCK ON ERROR 3A154610
OEC5 0 70F4      MDX      B885      LOOP 3A154620
OEC6 0 700F      MDX      88A0      EXIT TO NEXT ROUTINE 3A154630
OEC7 0 0000      DC      /0000      STORAGE 3A154640
OEC8 0000      BSS E      3A154650
OEC8 0 0000      N882 DC /0000 3A154660
OEC9 0 FFFF      DC /FFFF 3A154670
OEC9 0 FFFF      DC /FFFF 3A154680
OECA 0 0001      N884 OC /0001 3A154690
OECB 0 0010      N885 DC /0010 3A154700
OECB 0 8000      N886 DC /8000 3A154710
OECB 0 FFD0      N887 OC /FFD0 3A154720
OECB 0 0000      N888 OC /0000 3A154730
OECF 0 0000      OC /0000 3A154740
OED0 0 0000      N88A OC /0000 3A154750
OED1 0 0002      N88B DC /0002 3A154760
OED2 0 0020      N88C OC /0020 3A154770
OED3 0 FFD0      N88D DC /FFD0 3A154780
OED4 0 FFD0      N88E OC /FFD0 3A154790
OED5 0 7FFF      N88F DC /7FFF 3A154800
```

```
*****
*
* TEST COMPARE INSTRUCTION
*
* A # ACCUMULATOR
* Q # ACCUMULATOR EXTENTION
* M # WORD BEING COMPARED
* MCL # 2ND WORD ON DCM
*
* THE 1800 HAS A COMPARE INSTRUCTION
* BUT THE 1130 DOES NOT. THIS ROUTINE
* DETERMINES WHICH MACHINE IS BEING
* TESTED BEFORE ATTEMPTING A COMPARE
* INSTRUCTION.
*
* INDEX REGISTERS ARE HARDWARE IN 1800
* AND CORE STORAGE LOCATIONS IN 1130.
*
```

```
*****
CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *REL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
OED6 0 1810      B8A0 SRA 16      CK FOR 1130 OR 1800 3A155000
OED7 0 0400 0001      STO L /0001      STORE /0000 AT ADDR /0001 3A155010
OED9 0 61FF      LDX 1 -1      LO XR 1 WITH /FFFF 3A155020
OEDA 0 C400 0001      LD L /0001      LO C#N880 3A155030
OEDC 0 4C20 OF5C      BSC L W8C0,2 BRANCH IF 1130 3A155040
OEDE 0 C072      LD      N8A2      LD C#N8A2 3A155050
```

CPU FUNCTION TEST

```
OEDF 0 8075      CMP      N8A0      A GREATER THAN M 3A155100
OEE0 0 7004      MDX      J8A0      A GREATER THAN M 3A155110
OEE1 0 1000      SLA 0      A LESS THAN M 3A155120
OEE2 0 4400 OF69      8S1 L F000      A GREATER THAN M FAILED 3A155130
OEE4 0 3148      DC /3148      ERR ID 3A155140
OEE5 0 4400 OF98 J8A0 8S1 L F00E      CK LOCK ON ERROR 3A155150
OEE7 0 70EE      MDX      88A0      LOOP 3A155160
OEE8 0 F068      EOR      N8A2      ZERO WITH /4000 3A155170
OEE9 0 4C18 OEF1      BSC L 88A1,6- BRANCH ON ZERO 3A155180
OEEB 0 4400 OF69      8S1 L F000      ACC CHANGED ERROR 3A155190
OEED 0 314C      DC /314C      ERR ID 3A155200
OEEE 0 4400 OFC4      8S1 L F005      CK LOCK ON ERROR 3A155210
OEF0 0 70E5      MDX      88A0      LOOP 3A155220
*****
OEF1 0 C063      B8A1 LD N8A0      N8A0 #/0000 3A155230
OEF2 0 805D      CMP      N8A1      N8A1 #/1000 3A155240
OEF3 0 7001      MDX      J8A2      A LESS THAN M FAILED 3A155250
OEF4 0 7003      MDX      J8A1      A LESS THAN M 3A155260
OEF5 0 4400 OF69 J8A2 8S1 L F000      A LESS THAN M FAILED 3A155270
OEF7 0 314D      DC /314D      ERR ID 3A155280
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155290
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155300
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155310
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155320
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155330
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155340
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155350
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155360
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155370
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155380
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155390
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155400
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155410
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155420
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155430
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155440
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155450
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155460
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155470
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155480
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155490
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155500
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155510
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155520
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155530
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155540
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155550
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155560
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155570
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155580
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155590
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155600
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155610
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155620
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155630
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155640
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155650
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155660
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155670
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155680
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155690
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155700
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155710
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155720
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155730
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155740
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155750
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155760
OEF8 0 4400 OFC4 J8A1 8S1 L F005      CK LOCK ON ERROR 3A155770
```

```
*****
*
* TEST DOUBLE COMPARE
*
* CORE DATA OR *LA- OPER-
ADDR INSTRUCTION *REL ATION FT OPERANDS & REMARKS ID&SEQ# AT RIGHT
*****
OEF2 0 C831      B8C0 LDD N8C6      LD A#/8000 Q#/0001 3A155770
```

OF25 0 B82E OCM N8C5 AQ GREATER THAN M, M&1 3A155780
OF26 0 7003 MOX J8C0 3A155790
OF27 0 1000 SLA 0 NO-OP 3A155800
OF28 0 4040 8SI F000 FAILED A,Q NOT GREATER 3A155810
OF29 0 3152 OC /3152 ERR IO 3A155820
OF2A 0 4400 OF98 J8C0 8SI L F00E CK LOCK ON ERROR 3A155830
OF2C 0 70F7 MOX 88C0 LOOP 3A155840
OF20 0 F028 EOR N8C6 ZERO WITH /8000 3A155850
OF2E 0 4C18 OF32 8SC L J8C1,6- BRANCH ON ZERO 3A155860
OF30 0 4038 8SI F000 ACC CHANGED 3A155870
OF31 0 3153 OC /3153 ERR IO 3A155880
OF32 0 4400 OF98 J8C1 8SI L F00E CK LOCK ON ERROR 3A155890
OF34 0 70EF MOX 88C0 LOOP 3A155900
OF35 0 1800 RTE 16 NOW A#/0001 Q#/0000 3A155910
OF36 0 F020 EOR N8C6&1 ZERO WITH /0001 3A155920
OF37 0 4C18 OF38 8SC L J8C2,6- BRANCH ON ZERO 3A155930
OF39 0 402F 8SI F000 Q REG CHANGED 3A155940
OF3A 0 3154 OC /3154 ERR IO 3A155950
OF38 0 4400 OFC4 J8C2 8SI L F005 CK LOCK ON ERROR 3A155960
OF30 0 70F6 MOX 88C0 LOOP 3A155970
***** 3A155980
OF3E 0 C819 88C1 LOO N8C7 LO A#/0000 Q#/8000 3A155990
OF3F 0 881A OCM N8C8 A,Q LESS THAN M, M&1 3A156000
OF40 0 7001 MOX J8C3 A,Q GREATER THAN M,M&1 3A156010
OF41 0 7002 MOX J8C4 A,Q LESS THAN M,M&1 3A156020
OF42 0 4026 J8C3 8SI F000 FAILED A,Q GREATER 3A156030
OF43 0 3155 OC /3155 ERR IO 3A156040
OF44 0 407F J8C4 8SI F005 CK LOCK ON ERROR 3A156050
OF45 0 70F8 MOX 88C1 LOOP 3A156060
***** 3A156070
OF46 0 C811 88C2 LOO N8C7 LO A#/0000 Q#/8000 3A156080
OF47 0 8810 OCM N8C7 A,Q EQUQL M,M&1 3A156090
OF48 0 7002 MOX J8C5 A,Q GREATER 3A156100
OF49 0 7001 MOX J8C5 A,Q LESS 3A156110
OF4A 0 7002 MOX J8C6 A,Q # M,M&1 3A156120
OF4B 0 4010 J8C5 8SI F000 A,Q # M,M&1 FAILED 3A156130
OF4C 0 3156 OC /3156 ERR IO 3A156140
OF40 0 4076 J8C6 8SI F005 CK LOCK ON ERROR 3A156150
OF4E 0 70F7 MOX 88C2 LOOP 3A156160
OF4F 0 700C MOX W8C0 EXIT TO NEXT ROUTINE 3A156170
OF50 0 1000 N8A1 OC /1000 3A156180
OF51 0 4000 N8A2 OC /4000 3A156190
OF52 0 2000 N8A3 OC /2000 3A156200
OF54 0 0000 8SS E 0 3A156210
OF54 0 8000 N8C5 OC /8000 3A156220
OF55 0 0000 N8A0 OC /0000 3A156230
OF56 0 8000 N8C6 OC /8000 3A156240
OF57 0 0001 OC /0001 3A156250
OF58 0 0000 N8C7 OC /0000 3A156260
OF59 0 8000 OC /8000 3A156270
OF5A 0 0000 N8C8 OC /0000 3A156280
OF5B 0 8001 OC /8001 3A156290
***** 3A156300
***** 3A156310
***** 3A156320
***** 3A156330
CORE DATA OR *LA- OPER- 3A156340
A00R INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT 3A156350
***** 3A156360
OF5C 0 0809 W8C0 X10 N8C1 READ SWITCHES 3A156370
OF50 0 C00A LO N8C3 LO SW BITS 3A156380
OF5E 0 1804 SRA 4 PLACE SW 11 AT BIT 15 POS. 3A156390
OF5F 0 4804 8SC E IS SWITCH 11 ON 3A156400
OF60 0 7002 MOX W8C4 SWITCH 11 ON 3A156410
OF61 0 C003 LO Z020 SWITCH 11 IS OFF-WAIT 3A156420
OF62 0 3003 X007 OC /3003 PROGRAM FINISHED 3A156430
OF63 0 4C00 0154 W8C4 8SC L A140 3A156440
OF65 0 0003 Z020 OC /0003 3A156450
OF66 0 0000 8SS E 3A156460

OF66 0 OF68 N8C1 OC N8C3 3A156460
OF67 0 0240 N8C2 OC /0240 EQUAL /3A00 IN 1130 3A156470
OF68 0 0000 N8C3 OC /0000 3A156480
* 3A156490
***** 3A156500
* 3A156510
* 3A156520
* 3A156530
* 3A156540
***** 3A156550
* 3A156560
* 3A156570
* 3A156580
* 3A156590
* 3A156600
* 3A156610
* 3A156620
* 3A156630
* 3A156640
* 3A156650
* 3A156660
* 3A156670
* 3A156680
* 3A156690
* 3A156700
* 3A156710
* 3A156720
* 3A156730
* 3A156740
* 3A156750
* 3A156760
* 3A156770
* 3A156780
* 3A156790
* 3A156800
* 3A156810
* 3A156820
* 3A156830
* 3A156840
* 3A156850
* 3A156860
* 3A156870
* 3A156880
* 3A156890
* 3A156900
***** 3A156910
***** 3A156920
CORE DATA OR *LA- OPER- 3A156930
A00R INSTRUCTION *BEL ATION FT OPERANOS & REMARKS IO&SEQ# AT RIGHT 3A156940
***** 3A156950
OF85 0 C0E3 F00A LO F000 GET RETURN A00R AT F000 3A156960
OF86 0 0010 STO U008 STORE RETURN ADDRESS 3A156970
OF87 0 8000 A U003 A00 3 3A156980
OF88 0 00E0 STO F000 UPOATE RETURN ADDRESS 3A156990
OF89 0 4C80 OF69 8SC I F000 BR TO UPOATAO ADDRESS 3A157000
* 3A157010
OF88 0 1802 F00F SRA 2 PLACE SW 12 AT BIT POS 15 3A157020
OF8C 0 4804 8SC E SKIP IF SW 12 OFF 3A157030
OF80 0 70F5 MOX F008 BR TO EXIT IF SW 12 ON 3A157040
OF8E 0 1804 SRA 4 PLACE SW 8 AT BIT POS 15 3A157050
OF8F 0 4804 8SC E SKIP IF SW 8 OFF 3A157060
OF90 0 70F2 MOX F008 BR TO EXIT IF SW 8 ON 3A157070
OF91 0 C043 LO Z006 LO SWITCH READINGS 3A157080
OF92 0 0000 OC IMPROPER BIT SWS, 14 ON 3A157090
OF93 0 083E X10 F003 *WITHOUT 8 OR 12 ON 3A157100
OF94 0 70E5 MOX F00L 3A157110
OF95 0 0003 U003 OC 3 CONSTANT 3 3A157120
OF96 0 FFF0 U00A OC -3 CONSTANT -3 3A157130
OF97 0 0000 U008 OC 0 ERROR OCCURED CONTROL 3A157140

```

*
*****
*
*          LOCK ON ERROR RT
*
*****
CORE  DATA OR  *LA- OPER-
ADDR  INSTRUCTION *BEL ATION FT OPERANDS & REMARKS  ID&SEQ# AT RIGHT
*****
OF98 0 0000      F00E DC      0          CONTAINS RETURN ADDRESS 3A157230
OF99 0 281A      STS   F00H      SAVE REGS C AND OF              3A157240
OF9A 0 0038      STO   U00X      ACCUMULATOR                   3A157250
OF9B 0 18D0      RTE   16          ACC EXTENTION                 3A157260
OF9C 0 003A      STO   U00X&1     3A157270
*
*****
*  SET UP FOR RESTART
*
*  TO RESTART -- PRESS STOP, RESET AND START.
*
OF9D 0 C03A      LD     RST1      LD /6004                      3A157340
*
OF9E 0 D400 0000  STO L /0000     STO IN WORD ZERO              3A157360
*
OFA0 0 C038      LD     RST2      LD /4C00                      3A157380
*
OFA1 0 0400 0004  STO L /0004     STO IN WORD FOUR              3A157400
*
OFA3 0 C036      LO     RST2&1    LD /012C                      3A157420
*
OFA4 0 0400 0005  STO L /0005     STO IN WORD FIVE             3A157440
*
*****
OFA6 0 0828      XIO    F003      READ SWITCHES                 3A157470
OFA7 0 C02D      LD     Z000      CK LOOP ON INST BEING         3A157480
OFA8 0 1807      SRA     7          * TESTED SW                 3A157490
OFA9 0 4804      BSC     E          SKIP IF EVEN                3A157500
OFAA 0 700A      MOX     F008      EXIT TO LOOP INST            3A157510
OFAB 0 C0E8      LO     U008      CK IF ERROR HAS               3A157520
OFAC 0 4820      BSC     Z          * OCCURRED                   3A157530
OFAD 0 7009      MDX     F009      3A157540
OFAE 0 C0E9      F00K  LD     F00E      GOT RETURN ADDR         3A157550
OFAF 0 8024      A       U006      ADD ONE                       3A157560
OF80 0 D0E7      STO     F00E      STORE RETURN ADDRESS        3A157570
OF81 0 C025      LD     U00X&1     RESTORE REGS                 3A157580
OF82 0 18D0      RTE     16          3A157590
OF83 0 C022      LD     U00X      3A157600
OF84 0 2000      F00H  LDS     0          SET C AND OF OFF       3A157610
OF85 0 4C80 OF98  F008  BSC I F00E      BR TO RETURN ADDRESS    3A157620
OF87 0 C01D      F009  LD     Z000      CHECK LOCK ON ERROR SW   3A157630
OF88 0 1803      SRA     3          SHIFT BIT 12 TO POS 15      3A157640
OF89 0 4804      BSC     E          SKIP IF OFF                  3A157650
OF8A 0 7003      MOX     F00C      ERROR SW %8 12 ON            3A157660
OF8B 0 1810      SRA     16         RESET ERROR OCCURRED       3A157670
OF8C 0 D0DA      STO     U008      * CONTROL                     3A157680
OF8D 0 70F0      MOX     F00K      BR TO GET RETURN ADDRESS     3A157690
OF8E 0 C009      F00C  LO     F00E      GOT ADDR                 3A157700
OF8F 0 80D6      A       U00A      ADD MINUS THREE              3A157710
OF90 0 F0D6      EOR     U008      COMPARE TO ERR CONTR         3A157720
*
*  ADDR
*
OF91 0 4820      BSC     Z          SKIP ON ZERO                3A157740
OF92 0 70E8      MOX     F00K      BR TO GET RETURN ADDRESS     3A157750
OF93 0 70F1      MDX     F008      EXIT                          3A157760
*
*****
*
*          CK LOOP RT. SW RT
*
*****
3A157810
```

```

CORE  DATA OR  *LA- OPER-
ADDR  INSTRUCTION *BEL ATION F1 OPERANDS & REMARKS  ID&SEQ# AT RIGHT
*****
OFC4 0 0000      F005 DC      0          WILL CONTAIN RETURN ADDR 3A157820
OFC5 0 080C      XIO    F003      REAO SWS - PLACE IN LABEL    3A157830
*
*****
OFC6 0 C00E      LD     Z000      CK LOOP ROUTINE SW           3A157840
OFC7 0 1805      SRA     5          CHECK FOR BIT 11            3A157850
OFC8 0 4804      BSC     E          NO SKIP FOR LOOP            3A157860
OFC9 0 7003      MDX     F00G      LOOP ROUTINE SWITCH ON       3A157870
OFCa 0 C0F9      LO     F005      LD RETURN ADDRESS            3A157880
OFCB 0 D0CC      STO     F00E      SAVE FOR LOCK ON ERROR RTN   3A157890
OFCC 0 70CC      MDX     F00E&1    BR TO SAVE REGISTERS         3A157900
OFCD 0 4C80 OFC4  F00G  BSC I F005      BR TO MAIN PROGRAM      3A157910
*
*  RETURN ADDRESS
*
OFCF 0 0000      U000 DC      /0000    A REG SAVED HERE         3A157920
OFD0 0 0000      U001 DC      /0000    Q REG SAVED HERE         3A157930
OFD2 0 0000      BSS     E          3A157940
OFD2 0 0F05      F003 DC      Z000      3A157950
OFD3 0 0240      F004 DC      /0240    EQUAL /3A00 IN 1130     3A158000
OFD4 0 0001      U006 DC      /0001    3A158010
OFD5 0 0000      Z000 OC      /0000    SW READING STORED HERE   3A158020
OFD6 0 0002      U00X  BSS     2          SAVED FOR A&Q STORAGE 3A158030
OFD8 0 6004      RST1 LDX     /0004    3A158040
OFD9 0 4C00 012E RST2  BSC L A080    3A158050
OFDC 0 012D      END     X000      3A158060
*
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
3A158070
```


C R O S S R E F E R E N C E

NAME	VALUE	REFERENCES
A0C0	013F	013A,300F,3010,3011,3012
A0B0	012E	0F09,3004,3005,3006,3007,300B,3009,300A,300B,300C,300D,300E
A1C0	01EB	01E9,3030,303E
A1D0	01F5	01F2,303F,3040,3041,3042,3043,3044,3045
A1E0	0214	0210,3046,3047
A1F0	0220	021D,304B,3049
A100	014C	3013,3014,3015
A140	0154	0F63,3016,3017,3018,3019,301A,301B,301C,301D,301E,301F,3020,3021 3022,3023,3024,3025,3026,3027,302B,3029,302E
A180	01A0	019E,302A,302B,302C,302D,302F,3030,3031,3032,3033,3034,3035,3036 3037,303B,3039,303A,303B,303C
A2C0	0336	0340,3072
A2C0	0318	0311,0321,306F
A2C4	0322	032B,3070
A2CB	032C	0335,3071
A200	022D	0229,304A,304B,304C,304D,304E,304F,3050,3051,3052,3053,3054,3055 3056,3057,305B,3059,305A,305B,305C,305D,305E,305F
A240	0270	026B,3060,3061,3062,3063,3064
A280	02D8	02B8,02C6,02E1,306A
A2B1	02E2	02EC,306B
A2B2	02ED	02F7,306C
A2B3	02FB	0302,306D
A2B4	0303	0310,306E
A3C0	03DC	03D5,03EB,03F2,3080,3081
A3C4	03F3	0400,0409,3082,3083
A300	0344	0341,034D,3073
A302	034E	035B,3074
A304	0359	0363,3075
A340	0367	0364,0372,037C,3076,3077
A38C	038C	03CA,03D4,307E,307F
A380	0380	037D,038A,0394,307B,3079
A384	0395	039E,03A7,307A,307B
A38B	03AB	03B1,03B8,307C,307D
A4CC	05A7	05B4,05BD,30AB,30A9
A4C0	055F	055B,056A,30A1
A4C2	056B	056B,056E,057C,0585,058F,30A2,30A3,30A4,30A5
A4C8	0590	059D,05A6,30A6,30A7
A400	0412	040A,041F,0427,0432,30B4,30B5,30B6
A40B	0433	0441,0449,0452,30B7,30B8,30B9
A44A	04F9	0505,050E,051B,3099,309A,309B
A440	04BD	04B5,04C8,04D0,04D9,3093,3094,3095
A444	040A	04E6,04EF,04FB,3096,3097,309B
A480	0542	053B,054D,309F
A4B2	054E	055A,30A0
A5C0	0730	0747,0750,30CE,30CF
A5C4	0751	075F,0769,30D0,30D1
A5C6	076A	0779,07B3,30D2,30D3
A50A	05FC	0607,060E,30AF,30B0,3170
A50C	0619	061B,0625,062C,30B1,30B2
A50E	0620	0626,0639,0640,30B3,30B4
A500	05C4	05BE,05CE,30AA
A502	05CF	05D9,30AB
A504	05DA	05E5,05F0,30AC,30AD
A50B	05F1	05FB,30AE
A54A	06BB	06B3,06C4,06CC,30C0,30C1
A54C	06CD	06C5,06D6,06DE,30C2,30C3
A54E	06DF	06D7,06EB,06F0,30C4,30C5
A54F	06F1	06E9,06F8,0703,30C6,30C7
A540	0660	0650,0657,066B,0672,06B0,30B7,30B8,30B9
A544	06B1	066C,068C,0693,30BA,30BB
A546	0696	06B0,0694,06A1,06AB,30BC,30BD
A54B	06A9	06A2,06B2,06BA,30BE,30BF
A5B0	0704	06FC,070D,0716,30C8,30C9
A5B4	0717	0720,072A,30CA,30CB
A5B8	072B	0733,073C,30CC,30CD
A6C0	0954	0944,094B,0964,096B,30F0,30F1

A6C2	096C	0965,097C,0983,30F2,30F3
A6C4	09B4	0970,0993,099A,30F4,30F5
A6C6	099B	0994,09AB,09B2,30F6,30F7
A6C8	09B3	09AC,09C3,09CA,09DB,30F8,30F9
A6D0	09DC	09C4,09CB,09E7,315D
A6D2	09E8	09F3,315E
A6D3	09F4	09FF,315F
A6D5	0A00	0A0B,3163
A6D6	0A0C	0A17,3164
A6F0	0A1B	0A26,3165
A6F1	0A29	0A27,0A37,3166
A60A	07C7	0703,30D9
A60C	07D4	07E0,30DA
A60E	07E1	07E0,30DB
A600	078F	07B7,0797,30D4
A602	079B	07A0,30D5
A604	07A1	07AC,30D6
A606	07AD	07B9,30D7
A60B	07BA	07C6,30D8
A64A	0B5C	0B69,30E3
A64C	0B6A	0B77,30E4
A640	0B10	0B0A,0B1C,0B26,30DE,3167
A642	0B27	0B33,30DF
A644	0B34	0B40,30E0
A646	0B41	0B4D,30E1
A64B	0B4E	0B5B,30E2
A660	0B7F	0B7A,0B8C,0B96,3157,315B
A662	0B97	0BA4,0BAE,3159,315A
A664	0BAF	0BBC,0BC6,315B,315C
A670	0BC9	0BC7,0BD2,0BD9,3169
A68C	091B	0922,092B,30EB,30EC
A680	0BDC	0BD3,0BE7,0BF0,30E5,30E6
A6B4	0BF1	0BF8,0903,30E7,30E8
A6B8	0904	090E,0917,30E9,30EA
A7CC	0C2B	0C31,0C3A,3125,3126
A7C0	0BEC	0BE0,0BF6,0C00,311F,3120
A7C4	0C01	0C0A,0C14,3121,3122
A7C8	0C15	0C1E,0C27,3123,3124
A70C	0A7D	0AB9,0A97,0A9E,3100,3101,3102
A700	0A3B	0A44,0A4E,30FA,30FB
A704	0A4F	0A5B,0A65,30FC,30FD
A70B	0A66	0A72,0A7C,30FE,30FF
A74C	0B03	0B0F,0B19,0B25,0B2C,310B,310C,310D,310E
A740	0AAB	0A9B,0A9F,0AB8,0AC3,0ACF,0AD6,3103,3104,3105,3106
A746	0AD7	0AE5,0AE6,0AFB,0B02,3107,3108,3109,310A
A78A	0BB8	0BC1,0BC8,311B,311C
A7BE	0BCC	0BD5,0BDF,311D,311E
A7B0	0B79	0B6C,0BB5,0BBF,0B9B,0BA2,3115,3116,3117,311B
A7B6	0BA3	0BAD,0BB7,3119,311A
AB0C	0C9A	0C93,0CA4,312F
AB0E	0CA9	0C83,3130
AB00	0C43	0C3B,0C53,0C5E,0C69,0C70,3127,312B,3129,312A
AB06	0C71	0C6A,0C7D,0C87,0C92,0C99,312B,312C,312D,312E
AB4A	0DB2	0D8B,3171
AB40	0D56	0D2D,0D63,3135
AB42	0D64	0D7B,3136,316F
AB44	0D79	0D87,3137
AB46	0DB8	0D91,313B
AB4B	0D92	0D9B,3139
AB49	0D9C	0D81,313A,316B
AB5A	0DBC	0DC4,3172
AB8A	0E4B	0E5B,3173
AB8C	0E59	0E64,0E6D,0E77,3141,3142,3143
AB80	0DCF	0DC5,0D0E,0D0B,0D0E,0DF5,313B,313C,3160
AB84	0DF6	0DEF,0E06,0E14,0E1D,313D,313E,3161
AB8B	0E1E	0E2C,0E3A,313F,3140
AB89	0E3B	0E4A,3162
A900	02B2	3065,3066,3067,306B,3069

CPU FUNCTION TEST

B40A 0490 04A3,04AB,04B4,3090,3091,3092
B400 0453 045E,0467,0470,308A,308B,308C
B405 0471 047D,0486,048F,3080,308E,308F
B440 0519 0529,0531,053A,309C,3090,309E
B500 0641 063A,064F,0656,30B5,30B6
B600 07EE 07F8,300C
B602 07FC 0809,30DD
B680 092C 0937,0943,094A,30E0,30EE,30EF
B742 0820 0839,0843,084F,0856,310F,3110,3111,3112
B747 0857 0861,086B,3113,3114
B8A0 0E06 0EC6,0EE7,0EF0,314B,314C
B8A1 0EF1 0EE9,0EFA,3140
B8A2 0EFB 0F04,314E
B8A3 0F05 0F0E,314F
B8A4 0F0F 0F18,3150
B8A5 0F19 0F23,3151
B8C0 0F24 0F2C,0F34,0F3D,3152,3153,3154
B8C1 0F3E 0F45,3155
B8C2 0F46 0F4E,3156
B800 0CB4 0CBE,3131
B802 0CBF 0CC9,3132
B804 0CCA 0CC4,3133
B806 0CD5 0COF,3134
B807 0004 0CE0,000E,316A
B808 0D0F 0D19,316B
B809 001A 0025,316C
B810 0026 0055,316D,316E
B882 0E78 0E84,0E80,0E99,3144,3145,3146
B884 0E9A 0EA4,0EAD,0EB9,3147,3148,3149
B885 0EBA 0EC5,314A
F00A 0F85 0F72
F00B 0F83 0F8D,0F90
F00C 0F8E 0F8A
F00E 0F98 0370,0388,03AF,03C8,03E6,03FE,0410,0425,043F,0447,045C,0465,047B
0484,04A1,04A9,04C6,04CE,04E4,04E0,0503,050C,0527,052F,057A,0583
059B,05B2,05E3,0605,060C,0669,0670,070B,071E,0731,0745,0750,0777
081A,088A,08A2,08BA,0807,08E5,08F9,090C,0920,0935,0A42,0A59,0A70
0A87,0AB6,0AC1,0AE3,0AEC,0B00,0B17,0B37,0B41,0B5F,0B83,0B80,0BAB
0BBF,0B03,0BF4,0C08,0C1C,0C2F,0C51,0C5C,0C7B,0C85,0D3D,0D46,0DDC
0DE6,0E04,0E12,0E2A,0E62,0E68,0E82,0E8B,0EA2,0EAB,0EE5,0F2A,0F32
0FAE,0FB0,0FB5,0FBE,0FCB,0FCC
F00F 0F8B 0F7D
F00G 0FCD 0FC9
F00H 0F84 0F99
F00K 0FAE 0FBD,0FC2
F00L 0F7A 0F94
F00X 0F81 0F6A
F000 0F69 02DC,02E7,02F2,02F0,030B,031C,0326,0330,033B,0348,0353,035E,036D
0377,0385,038F,0399,03A2,03AC,03B6,03C5,03CF,03E3,03E0,03FB,0404
041A,0422,042D,043C,0444,044D,0459,0462,046B,047B,0481,048A,049E
04A6,04AF,04C3,04CB,04D4,04E1,04EA,04F3,0500,0509,0513,0524,052C
0535,0548,0555,0565,0571,0577,0580,058A,0598,05A1,05AF,05B8,05C9
0504,05E0,05EB,05F6,0602,0609,0613,0620,0627,0634,063B,064A,0651
0666,0660,067B,0687,068E,069C,06A3,06AD,06B5,06BF,06C7,06D1,06D9
06E3,06EB,06F5,06FE,0708,0711,071B,0725,072E,0737,0742,074B,075A
0764,0774,077E,0792,079B,07A7,07B4,07C1,07CE,070B,07EB,07F6,0804
0817,0821,082E,083B,0848,0856,0864,0872,0887,0891,089F,08A9,08B7
08C1,0804,08E2,08EB,08F6,08FE,0909,0912,091D,0926,0932,093E,0945
095F,0966,0977,097E,098E,0995,09A6,09A0,09BE,09C5,09E2,09EE,09FA
0A06,0A12,0A21,0A32,0A3F,0A49,0A56,0A60,0A6D,0A77,0A84,0A92,0A99
0AB3,0ABE,0ACA,0A01,0AE0,0AE9,0AF6,0AFO,0B0A,0B14,0B20,0B27,0B34
0B3E,0B4A,0B51,0B5C,0B66,0B80,0B8A,0B96,0B90,0BA8,0BB2,0BBC,0BC6
0B00,0BDA,0BF1,0BF8,0C05,0C0F,0C19,0C22,0C2C,0C35,0C4E,0C59,0C64
0C6B,0C78,0CB2,0CB0,0C94,0C9F,0CAE,0CB9,0CC4,0CCF,0C0A,0D09,0D14
0D20,0D3A,0D43,0D5E,0D6A,0D71,0D82,0D8C,0D96,0DA5,0DAC,0DB6,0DBF
0DD9,0DE3,0DF0,0E01,0E0F,0E1B,0E27,0E35,0E45,0E5F,0E68,0E72,0E7F
0E88,0E94,0E9F,0EA8,0EB4,0EC0,0EE2,0EEB,0EF5,0EFF,0F09,0F13,0F1E
0F28,0F30,0F39,0F42,0F48,0F73,0F76,0F79,0F83,0F85,0F88,0F89,3174

CPU FUNCTION TEST

F002 0FB2 0F75
F003 0F02 0027,0F6E,0F93,0FA6,0FC5
F004 0F03 029A,02A9
F005 0FC4 020F,02EA,02F5,0300,030E,031F,0329,0333,033E,0348,0356,0361,037A
0392,039C,03A5,03B9,0302,03F0,0407,0430,0450,046E,048D,04B2,0407
04F6,0516,0538,054B,0558,0568,058D,05A4,05B8,05CC,05D7,05EE,05F9
0616,0623,062A,0637,063E,064D,0654,067E,068A,0691,069F,06A6,06B0
06B8,06C2,06CA,0604,060C,06E6,06EE,06F9,0701,0714,0728,073A,074E
0767,0781,0795,079E,07AA,07B7,07C4,0701,07DE,07E8,07F9,0807,0824
0831,083E,084B,0859,0867,0875,0894,08AC,08C4,08D0,08EE,0901,0915
0929,0941,0948,0962,0969,097A,0981,0991,0998,09A9,09B0,09C1,09C8
09E5,09F1,09FD,0A09,0A15,0A24,0A35,0A4C,0A63,0A7A,0A95,0A9C,0ACD
0AD4,0AF9,0B00,0B23,0B2A,0B4D,0B54,0B69,0B99,0BA0,0BB5,0BC9,0BD0
0BFE,0C12,0C25,0C38,0C67,0C6E,0C90,0C97,0CA2,0CB1,0CBC,0CC7,0C02
0CD0,000C,0017,0D23,0D53,0D61,0D76,0D85,0D8F,0D99,0DAF,0DB9,0DC2
0DEC,00F3,0E1B,0E38,0E4B,0E56,0E75,0E97,0EB7,0EC3,0EEE,0EF8,0F02
0F0C,0F16,0F21,0F3B,0F44,0F40,0FCA,0FCD
F007 0207 029C,02AB
F008 0FB5 0FAA,0FC3
F009 0FB7 0FAD
F902 02C8 02AC,02BF
F903 02C9 0297,02A6,02B5
F904 02CA 02CA
F911 02CB 0282,0286
F912 02CC 0283,0285,02CB
F913 02C0 0284
F915 02CE 02AE,02B1
F916 02CF 028C
F917 02D0 02A0,02C0,02C8
F91B 0201 0289,028D
F919 0202 0296
F920 0203 02A5,02B6
F922 02D4 0290,02B9
F923 02D6 029E,029F,02A2,02BA
G0C1 0144 0141
G0C2 0147 0145
G0B0 0130 012E
G0B1 0133 0130
G0B2 0138 0133
G0B3 013A 013B
G0B4 013B 0138
G14A 01B1 017F
G14B 01B5 01B3
G14C 01B9 01B7
G14D 01B0 01B8
G14E 0191 01BF
G14F 0195 0193
G140 015A 0158
G141 0150 015B
G142 0161 015F
G143 0165 0163
G144 0169 0167
G145 016D 016B
G146 0171 016F
G147 0175 0173
G148 0179 0177
G149 017D 017B
G150 0199 0197
G18A 01D0 01CE
G18B 01D4 01D2
G18C 01D8 01D6
G180 01DC 01DA
G18E 01E0 01OE
G18F 01E4 01E2
G181 01AC 01AA
G182 01B0 01AE
G183 01B4 01B2
G184 01B8 01B6

G185 018C 018A
G186 01C0 018E
G187 01C4 01C2
G188 01C8 01C6
G189 01CC 01CA
G2CC 033E 0339
G2C0 031F 031A
G2C4 0329 0324
G2CB 0333 032E
G20A 0250 0259
G208 0267 0265
G20C 0268 026F
G200 0262 0260
G200 0231 0220
G201 0236 0232
G202 023A 0236
G203 023E 023A
G204 0242 0240
G205 0247 0243
G206 024F 024D
G207 0254 0252
G208 0248 0247
G209 0258 0256
G280 02DF 020A
G281 02EA 02E5
G282 02F5 02F0
G283 0300 02FB
G284 030E 0309
G3C0 03E6 03E1
G3C2 03F0 03E8
G3C4 03FE 03F9
G3C6 0407 0402
G300 0348 0345
G3D2 0356 0351
G304 0361 035C
G340 0370 0368
G342 037A 0375
G38A 0389 0384
G38C 03C8 03C3
G38E 03D2 03CD
G380 0388 0383
G382 0392 0380
G384 039C 0397
G386 03A5 03A0
G388 03AF 03AA
G4CA 05A4 059F
G4CC 05B2 05A0
G4CD 0588 0586
G4C0 0568 0563
C4C2 057A 0576
G4C4 0583 057F
G4C6 0580 0588
G4C8 0598 0596
G40C 043F 0438
G40E 0450 0448
G400 0425 0420
G404 0410 0418
G406 0430 0428
G407 043C 0439
G408 0447 0442
G44A 050C 0507
G44C 0500 04FD
G440 0503 04FF
G44E 0516 0511
G440 04CE 04C9
G442 04C6 04C1
G443 0407 04D2
G444 04ED 04EB

G446 04E1 04DE
G447 04E4 04E0
G448 04F6 04F1
G480 0548 0546
G482 0558 0553
G5CA 0781 077C
G5C0 0745 0740
G5C2 074E 0749
G5C4 075D 0758
G5C6 0767 0762
G5C8 0777 0772
G50A 060F 05FE,060B
G50C 061F 0618
G50E 0634 0630
G500 05CC 05C8
G502 0507 05D3
G504 05E0 05DE
G505 05E3 050F
G506 05E8 05E9
G507 05EE 05EA
G508 05F6 05F4
G54A 06C6 068C
G54C 06D8 06CE
G54E 06EA 06E0
G54F 06FD 06F2
G540 0674 0662,0673
G542 067E 0679
G544 0695 0683
G546 0698 0697
G548 0684 06AA
G58A 073A 0735
G580 0708 0706
G582 0714 070F
G584 071E 0719
G586 0728 0723
G588 0731 072C
G6C0 0969 095D
G6C2 0981 0975
G6C4 0998 098C
G6C6 0980 09A4
G6C8 09C8 098C
G60A 07D1 07CC
G60C 070E 07D9
G60E 07E8 07E6
G600 0792 078F
G602 0798 0798
G604 07AA 07A5
G606 0787 0782
G608 07C4 078F
G64A 0867 0862
G64C 0875 0870
G640 081D 0815
G641 0824 081F
G642 0831 082C
G644 083E 0839
G646 0848 0846
G648 0859 0854
G660 088A 0885
G661 0894 088F
G662 08A2 0890
G663 08AC 08A7
G664 088A 0885
G665 08C4 088F
G670 08D4 08C8
G671 08C8 08CF
G672 08C0 080A
G68A 0915 0910
G68C 0920 0918

G68E 0929 0924
G680 08E2 08DF
G682 08EE 08E9
G684 08F9 08F4
G686 0901 08FC
G688 090C 0907
G7CA 0C25 0C20
G7CC 0C2F 0C2A
G7CE 0C3B 0C33
G7C0 08F4 08EF
G7C2 08FE 08F9
G7C4 0C0B 0C03
G7C6 0C12 0C0D
G7C8 0C1C 0C17
G70A 0A7A 0A75
G70C 0A87 0A82
G70E 0A9C 0A8C
G700 0A42 0A3D
G702 0A4C 0A47
G704 0A59 0A54
G706 0A63 0A5E
G708 0A70 0A6B
G74A 0800 0AF2,0AFC
G74C 0B0D 0B0B
G74E 0B17 0B12
G740 0AB6 0AB1
G742 0AC1 0A8C
G744 0AD4 0AC6,0ADO
G746 0AE3 0ADE
G748 0AEC 0AE7
G78A 0BBF 0BBA
G78C 0BC9 0BC4
G78E 0BD3 0BCE
G780 0BB3 0B7E
G782 0BB0 0BBB
G784 0BA0 0B92,0B9C
G786 0BA8 0BA6
G788 0BB5 0BB0
G80A 0C97 0CB9
G80C 0CA2 0C9D
G80E 0CB1 0CAC
G800 0C51 0C4C
G802 0C5C 0C57
G804 0C6E 0C60
G806 0C7B 0C76
G808 0CB5 0CB0
G84A 0DB6 0DB4
G840 0D61 0D5C
G842 0D74 0D6F
G844 0D85 0D80
G846 0D8C 0DBA
G848 0D96 0D94
G849 0DAF 0DAA
G88A 0E38 0E33
G88B 0E56 0E53
G88C 0E62 0E5D
G88E 0E6B 0E66
G880 0DDC 0DD7
G881 0DE9 0DD6
G882 0DE6 0DE1
G883 0DF0 0DEB
G884 0E04 0DFF
G885 0E15 0DFC
G886 0E12 0E0D
G887 0E1B 0E17
G888 0E2A 0E25
G889 0E4B 0E43
G900 02AC 02A0,02B3

G901 02A5 0295
G902 029D 02A4
G903 0289 028E
G904 02BF 0287,0288,02C4
H4C2 0577 0574
H4C3 0574 056F
H4C4 0580 057D
H40A 04A9 04A4
H40D 04A1 049C
H40E 0482 04AD
H400 0465 0460
H402 045C 0457
H404 046E 0469
H405 047B 0477
H406 0484 047F
H407 0478 0475
H408 048D 048B
H440 052F 052A
H443 0527 0522
H444 0538 0533
H50A 0602 0600
H50B 0613 0611
H50C 0620 061D
H50E 063E 0632
H508 05F9 05F5
H54A 06CA 06BE
H54C 06DC 06D0
H54E 06EE 06E2
H54F 0701 06F4
H540 0666 0664
H544 0687 0685
H546 06A3 069A
H548 0688 06AC
H6C0 0966 095B
H6C2 097E 0970
H6C4 0995 098B
H6C6 09AD 099F
H6C8 09C5 09B7
H6D0 09E5 09E0
H6D2 09F1 09EC
H6D3 09FD 09FB
H6D5 0A09 0A04
H6D6 0A15 0A10
H6F0 0A24 0A1F
H6F1 0A32 0A2C,0A2D,0A2F,0A30
H6F2 0A35 0A31
H600 0795 0791
H602 079E 079A
H640 0B12 0B12,0B14
H680 0BE5 0BE1
H74A 0AFD 0AF4
H744 0AD1 0ACB
H780 0BDD 0BD8
H784 0B9D 0B94
H80A 0C94 0CBB
H80C 0C9F 0CA7
H804 0C6B 0C62
H84A 0D89 0D85
H842 0D6D 0D6B
H846 0D8F 0D8B
H848 0D99 0D95
H849 0D9E 0D9E,0DA2
H85A 0DC2 0D8E
J50A 0609 0601
J50C 0627 061E
J50E 063B 0633
J540 066D 0665
J544 06BE 06B6

J546 06A6 0699
J600 07F9 07F4
J602 08D7 08D2
J680 0935 0930
J682 0948 093A
J70E 0A99 0A90
J74A 0869 0864
J740 082A 081C,0826
J742 0837 0832
J744 0841 083C
J746 0854 0846,0850
J748 085F 085A
J8AA 0F1E 0F18,0F1C
J8A0 0EE5 0EE0
J8A1 0EF8 0EF4
J8A2 0EF5 0EF3
J8A3 0F02 0EFE
J8A4 0EFF 0EFD
J8A5 0F0C 0F08
J8A6 0F09 0FD7
J8A7 0F16 0F12
J8A8 0F13 0F11
J8A9 0F21 0F1D
J8C0 0F2A 0F26
J8C1 0F32 0F2E
J8C2 0F38 0F37
J8C3 0F42 0F40
J8C4 0F44 0F41
J8C5 0F48 0F48,0F49
J8C6 0F4D 0F4A
J80D 0C8C 0CB7
J802 0CC7 0CC2
J804 0CD2 0CCD
J806 0CDD 0CDB
J808 0D0C 0D07
J809 0D17 0D12
J810 0D23 0D1F
J811 0D30 0D3F,0D48,0D4F
J812 0D3D 0D38
J813 0D46 0D41
J814 0D27 0D52
J815 0D20 0D1D
J816 0D49 0D4C
J88A 0EC0 0EBE
J888 0EC3 0EBF
J880 0E75 0E70
J882 0E82 0E7D
J884 0E88 0E86
J886 0E97 0E92
J887 0EA2 0E9E
J888 0EAB 0EA6
J889 0EB7 0E82
K508 0616 0612
K50C 062A 061F
K640 0814 087C
K682 0945 093C
K740 0827 081E
K746 0851 0848
K849 0DA8 0DA3
N1C0 01F3 01E8
N1C1 01F4 01EE
N100 0211 01F8,01FC,01FF,0207
N1D1 0212 01F5,01FB,0208
N1D2 0213 0204,020D
N1E0 021E 0218,021A,021E
N1E1 021F 0214
N1F0 022A 022C
N1F1 0228 0224,0226,0228

N1F2 022C 022D
N100 0143 014C,014F
N140 019F 0154
N180 01EA 01A0,01A4
N2C0 0342 0318,0319,0322,032D
N2C2 0343 0323,032C,0336,0337,0338
N200 026C 0231,0250
N201 026D 0258
N202 026E 0262
N203 026F 0267
N24D 0271 0271,0275
N241 0273 0270,0274
N242 027C 027F
N243 027D 0278,027E
N280 0312 02D8
N281 0313 02E2,0303
N282 0314 02E4,0308
N283 0315 02E0
N284 0316 02EF,02FB
N285 0317 02FA
N3C0 04D8 03DE
N3C1 040C 03DC
N3C2 040D 03F5
N3C3 040E 03F3
N3C4 040F 03E0
N3C5 0410 03EA
N3C6 0411 03F8
N300 0365 0344,0345,034E
N302 0366 034F,0350,0359,035A,0358
N340 037E 0367
N341 037F 0369,0374
N380 03D6 0380
N381 03D7 0382,038C
N382 03D8 0395
N383 03D9 03A8,038C
N384 03DA 0383
N385 03DB 03CC
N4C0 058F 0561,0562,056D,0586,0592,0594,05A9,05AB
N4C1 05C0 0587
N4C2 05C1 0593,059E,05AA,0585
N4C3 05C2 0595
N4C4 05C3 05AC
N400 0486 0412,0415,0429
N401 0487 0492
N402 0488 0473
N403 0489 0455,047E
N404 048A 045F
N405 048B 0433,0453,0471,0490
N406 048C 0436
N44D 053C 048D,0519
N441 053D 048F,04DC,04FB,0518
N442 053E 04DA,04E7
N443 053F 04F9
N444 0540 0506
N445 0541 0510
N480 055C 0542,0550
N481 055D 0544,054E,0552
N482 055E 0543,0545,054F,0551
N5C1 0788 070.,0728,073D,0751,076E,0770
N5C3 078A 0717,0754,0757,0761,076A,077B,0784
N5C4 078B 0718,0722
N5C5 078C 073E,073F,0752,0755,0756,076B
N5C6 078D 0748,0753,0760,076C,076F,0771,0785
N5C7 078E 076D,077A,0786
N500 0658 05C5,05FD,060F,062F,0661,06A9
N501 0659 05D0,0696
N502 065A 05D8
N503 0658 05F2,0642

N504 065C 061A
N505 065D 0645,0646,0675,0676
N506 065E 0647
N507 05E6 05DC
N542 065F 0677,0681,0688,06CD
N6CA 09D6 095C
N6CB 0907 0974,0A03,0A0D
N6C0 0908 09A3,0A01,0A0F
N6CF 090A 0984,0988
N6C0 09CC 0957,09CC,09DF
N6C1 09C0 09CD,09DC,09E8,09F4,09F7
N6C2 09CE 09CE,09E8
N6C3 09CF 09CF
N6C4 09D0 0955,0960,0985,0987,099C,0986,09D0,09D9
N6C5 09D1 099E,09D1
N6C6 09D2 09D2
N6C7 09D3 09D3
N6C8 09D4 096F,09D4
N6C9 09D5 095A,095B,0972,0973,098A,0988,09A1,09A2,09B9,098A
N6F0 0A10 0A1A
N6F1 0A28 0A19,0A1E,0A28
N6F2 0A2D 0A2A
N6F3 0A31 0A2E
N600 0808 07C8,07D8,07E5,0801,0808
N601 080C 07A2,07A4,07AF,0781,078C,078E,07C9,07D6,07E3,07F1,07FF,080C
N602 080D 07F3,080D
N603 080E 07AE,0788,07C8,07D5,07E2,07F0,07FC
N604 080F 07FE
N640 0878 0811,0813,081D,0828,082A,082B,0835,0837,083B,0842,0844,0845,084F
0851,0852,085D,085F,0860,0868,086D,086E,0879
N642 087C 081E
N643 087D 084E,085C,086A,0878
N644 087E 0810,0827,0834,0841,0853,0861,086F
N660 08C8 0883,0884,088D,088E,0898,089C,08A5,08A6,0883,0884,088D,088E
N670 0808 08CA
N680 094C 08DD,08E8,08F2,0905,0906
N681 094D 08DE
N682 094E 08F3
N683 094F 0919,091A
N684 0950 0923,092D,092E
N686 0951 0939
N687 0952 090F
N688 0953 092F,0938
N7C0 0C3C 08EC
N7C1 0C3D 08ED
N7C2 0C3E 08EE
N7C3 0C3F 08F8
N7C4 0C40 0C01,0C02,0C16,0C28
N7C5 0C41 0C0C
N7C6 0C42 0C15,0C29,0C5F
N700 0AA0 0A39,0A50,0A7E
N701 0AA1 0A3A,0A53,0A68,0A74,0A8F
N702 0AA2 0A38,0A45,0A52,0A5C,0A69,0A73,0A80,0A8A,0A8E
N703 0AA3 0A3C,0A51
N704 0AA4 0A46,0A50,0AF1
N705 0AA5 0A67,0A7F,0AB1
N706 0AA6 0A88
N707 0AA7 0A6A
N74A 0874 0B11
N74B 0875 0B38
N74C 0876 0B2E
N74D 086D 0AA0,0AC4,0A0C,0AEF,0B06,0B1A,0B30,0B44
N742 086E 0AA9,0AAF,0A8A,0ADA,0B04,0B05,0B07,0B2F,0B31
N744 0870 0AAB
N746 0872 0AD8,0B57
N747 0873 0B58,0B59
N748 0878 0B18,0B45,0B63
N78A 08EA 0B88

N78D 08E9 08C3
N780 08E1 087C,0890
N782 08E2 087A,08A4,08CC
N784 08E4 0878
N785 08E5 08AF,08D7
N786 08E6 0870,0887,08A5,08B9
N787 08E7 08CD
N788 08E8 0891
N8A0 0F55 0EDF,0EF1,0EF8,0F05,0F10
N8A1 0F50 0EF2,0F19,0F1A
N8A2 0F51 0EDE,0EEB,0F06
N8A3 0F52 0EFC
N8C1 0F66 0F5C
N8C2 0F67 0298,02A7
N8C3 0F68 0F5D,0F66
N8C5 0F54 0F0F,0F25
N8C6 0F56 0F24,0F2D,0F36
N8C7 0F58 0F3E,0F46,0F47
N8C8 0F5A 0F3F
N80A 0CEA 0C85
N80C 0CEC 0CC0
N80E 0CEE 0C9C,0CC8
N80F 0CEF 0D11
N800 0CE1 0C48,0C74,0C8B
N802 0CE2 0C44
N804 0CE4 0C71
N806 0CE6 0C98
N807 0CE7 0CA6,0CA8,0CCC,0CD7,0D4A
N808 0CE8 0CAA,0C86
N810 0CF0 0C06
N811 0CF1 0C55
N812 0CF2 0C46,0C4A,0CC1
N813 0CF3 0C72,0C75
N816 0CF4 0C7F
N817 0CF5 0D06
N818 0CF6 0D05
N819 0CF8 0D10,0D2E,0D4E
N820 0CFA 0D1C
N821 0CF8 0D2F,0D30,0D31,0D35,0D36,0D49,0D48
N823 0D00 0D18
N824 0D02 0D33
N84A 0DC6 0D82
N840 0DC7 0D59,0D5A,0D7D,0D7E,0DA1,0DA8
N841 0DC8 0D58,0D7F,0DA9
N842 0DC9 0D65,0D6D,0D75
N843 0DCB 0D74
N844 0DCC 0D8C,0DCD
N845 0DCD 0D64,0D67,0D9F
N846 0DCE 0D6E
N88A 0ED0 0E7A,0E9A,0EB8
N888 0ED1 0E41
N88C 0ED2 0E59
N88D 0ED3 0E78
N88E 0ED4 0E08,0E90
N88F 0E05 0E51
N880 0EC7 0DD4,0DDF,0E07,0E09,0E2D,0E2F,0E6E,0E6F,0E8E,0E8F,0EAE,0EB0
N882 0EC8 0DD0,0E4E
N884 0ECA 0DF8,0E3E,0EB1
N885 0ECB 0E1E,0E31
N886 0ECC 0DFD,0E20,0E23,0E7C,0EA5
N887 0ECD 0DF6
N888 0ECE 0E58
RST1 0F08 0F9D
RST2 0FD9 0FA0,0FA3
S501 0651 0644
S503 0654 0648
U00A 0F96 0F8F
U00B 0F97 0F77,0F86,0FA8,0F8C,0FC0

U00X 0FD6 0F9A,0F9C,0FB1,0FB3
U000 0FCF 0F6B,0FB0
U001 0FD0 0F6D,0F7E
U003 0F95 0F87
U006 0FD4 0F78,0FAF
V1AC 027A 027C
V154 0241 023E
V168 024E 024B
V170 0253 0250
V174 0257 0254
V180 0261 025E
V184 0266 0263
W8C0 0F5C 0EDC,0F4F
W8C4 0F63 0F60
X000 012D 0FDC,3000
X001 02B4 02AF,3001
X003 02C5 02C1,3002
X007 0F62 3003
Z000 0FD5 0D29,0F6F,0F7A,0F91,0FA7,0FB7,0FC6,0FD2
Z020 0F65 0F61

END OF ASSEMBLY

----- LAST PAGE -----

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE.	01A
2. PREREQUISITES.	01A
2.1 PROGRAM PREREQUISITES	
2.2 EQUIPMENT PREREQUISITES	
3. USE PROCEDURE.	01A
3.1 NORMAL LOADING PROCEDURE	
3.2 DIAGNOSTIC LOADING PROCEDURE	
3.3 DIAGNOSTIC GUIDE	
3.4 ERRDR WAITS	
4. PRINTOUTS (NONE)	
5. COMMENTS	02A
5.1 BASIC-LOADER FIRST-CARD FUNCTIONS	
5.2 FUNCTIONS OF BASIC-LOADER CARDS (TWO THRU FIVE)	
6. APPENDIX	03
6.1 PUNCHED-CARD 8-8 FORMAT	

1. PURPOSE

THE 1130 BASIC DIAGNOSTIC LOADER IS A SELF-CHECKING PROGRAM DESIGNED TO LOAD AND VERIFY LOADING OF DIAGNOSTIC-CARD OR PAPER TAPE PROGRAMS PUNCHED IN 8-8 FORMAT.

2. PREREQUISITES

2.1 PROGRAM PREREQUISITES

THE BASIC LOADER WILL ONLY LOAD PROGRAM DECKS WHICH ARE PUNCHED IN THE 8-8 FORMAT DESCRIBED IN SECTION 6.1.

2.2 EQUIPMENT PREREQUISITES

- A. 1131 CENTRAL PROCESSING UNIT (CPU).
- B. 1442 CARD READ/PUNCH, OR PAPER TAPE READER.

3. USE PROCEDURE

3.1 NORMAL LOADING PROCEDURE

- A. AT 1442 CARD READ/PUNCH,
 - 1. DEPRESS NPRO PUSHBUTTON TO CLEAR FEED.
 - 2. PLACE BASIC LOADER DECK, FOLLOWED BY MAIN PROGRAM AND TWO BLANK CARDS IN HDPPER.
 - 3. DEPRESS START PUSHBUTTON. READY INDICATOR SHOULD LIGHT.
- B. AT PAPER TAPE READER
 - 1. SET TAPE IN READER
 - 2. MAKE READER READY
- C. AT 1131 CPU,
 - 1. PUSH RESET.
 - 2. PUSH PROGRAM LOAD. MAIN PROGRAM SHOULD LOAD AND BEGIN EXECUTION.
 - 3. IF PROGRAM FAILS TO LOAD OR HALTS AT A WAIT INSTRUCTION BELOW LOCATION 012C, REFER TO SECTION 3.2

3.2 DIAGNOSTIC LOADING PROCEDURE

- 1. SET INTERRUPT DELAY SWITCH (ON CE PANEL) TO ON POSITION.
 - 2. RETRY LOADING PROCEDURE.
- IF PROGRAM LOADS, RUN CPU AND INTERRUPT TESTS TO DIAGNDSSE NORMAL LOADER FAILURE.
- IF PROGRAM DOES NOT LOAD, REFER TO SECTION 3.3

3.3 DIAGNOSTIC GUIDE

NOTE

ALL REGISTER-CONTENT INDICATIONS IN FOLLOWING STEPS ARE EXPRESSED IN HEXADECIMAL NOTATION. ALL ADDRESSES APPLY TO BOTH PAPER TAPE AND CARD VERSIONS OF THE PROGRAM.

FAILURE DESCRIPTION	SUGGESTED ACTION + POSSIBLE CAUSE OF FAILURE
1. NO CARD FEEDS	REFER TO PROGRAM LOAD TESTS. POSSIBLE FAILURE OF EITHER PROGRAM-LOAD MODE OR READER.

BASIC DIAGNOSTIC LOADER

- 2. FIRST CARD FEEDS BUT IS NOT READ CORRECTLY. REFER TO PROGRAM LOAD TESTS. POSSIBLE FAILURE OF READER.
- 3. FIRST CARD IS READ CORRECTLY BUT NOT ABLE TO LOAD REMAINDER OF LOADER. REFER TO ONE-CARD PROGRAMS. POSSIBLE FAILURE OF CPU INSTRUCTIONS USED TO BOOTSTRAP LOADER.
- 4. MAIN PROGRAM STARTS EXECUTING BEFORE ALL CARDS HAVE BEEN LOADED. CHECK THAT LAST CARD OF PROGRAM, WHICH IS PUNCHED WITH FF IN COLUMNS 79 AND 80, IS NOT OUT OF SEQUENCE. IF CARD IS IN SEQUENCE, A READING PROBLEM IS INDICATED.
- 5. ALL CARDS FEED BUT MAIN PROGRAM DID NOT EXECUTE. SEE IF LAST CARD WENT PAST THE READ STATION OF THE 1442. IF IT DID, RUN ONE-CARD DIAGNOSTIC PROGRAMS. CHECK THAT MAIN PROGRAM IS FOLLOWED BY TWO BLANK CARDS.

3.4 ERROR WAITS

SBR	LOCATION	MEANING
30F1	001E	PROGRAM STOPPED BECAUSE CHECKSUM FOR FIRST CARD WAS NOT CORRECT (0000). CHECK THAT LOCATIONS 0000 TO 001E WERE READ CORRECTLY BY COMPARING WITH LISTING. IF NOT LOADED CORRECTLY, REFER TO PROGRAM LOAD TESTS. IF LOCATIONS WERE LOADED CORRECTLY, RUN ONE-CARD PROGRAMS TO HELP ISOLATE PROBLEM.
30F2	002F	PROGRAM STOPPED BECAUSE OF DSW ERROR. THE ONLY VALID WORDS ARE 8003, 0003, AND 0800. DETERMINE CAUSE OF DSW ERROR AND CORRECT. RELOAD AFTER REPAIRING.
30F3	004F	PROGRAM STOPPED BECAUSE FIRST WORD OF CARD 2 FAILED TO BE LOADED IN LOCATION 004F AND THEREFORE, DID NOT REPLACE THE WAIT INSTRUCTION AT THAT LOCATION. EXAMINE CARD 2 AND TRY RELOADING. IF NO IMPROVEMENT, RUN ONE-CARD DIAGNOSTIC PROGRAMS.
30F4	0095	PROGRAM STOPPED BECAUSE OF DSW ERROR. THE ONLY VALID WORDS ARE 8003, 0003, AND 0800. DETERMINE CAUSE OF DSW ERROR AND CORRECT. RELOAD AFTER REPAIR.
30F5	00A5	WHILE LOADING THE MAIN PROGRAM, PROGRAM FOUND THAT WORD COUNT IN LOCATION 0034 EQUALLED ZERO. PROBLEM MAY BE CAUSED BY A BLANK CARD IN DECK, OR READING FAILURE.
30F6	00B7	CHECKSUM ERROR. EITHER THE SUM OF LOCATIONS 0010 THRU 0036 DOES NOT EQUAL ZERO, OR AN ADD FAILURE HAS OCCURRED. COMPARE DATA IN LOCATIONS 0010 THRU 0036 WITH DATA IN CARD COLUMNS 1 THROUGH 78. IF CORRECT, RUN CARDS 2 THRU 5 OF ONE-CARD DIAGNOSTIC PROGRAMS TO HELP DETERMINE CAUSE OF FAILURE.
30F7	00DE	PROGRAM HAS FOUND THAT A WORD IN THE READ-IN AREA AND THE WORD AT LOCATION WHERE THE WORD READ IN WAS TRANSFERRED DO NOT AGREE. THE ADDRESSES OF THE WORDS FOUND NOT TO AGREE CAN BE FOUND AT LOCATIONS 00DA AND 00DC. THE PROBLEM MAY BE A DATA-TRANSFER ERROR OR AN EOR FAILURE. RUN ONE-CARD DIAGNOSTIC PROGRAMS TO DETERMINE CAUSE OF PROBLEM.

BASIC DIAGNOSTIC LOADER

- 4. PRINTOUTS (NONE)
- 5. COMMENTS

THE 1130 BASIC DIAGNOSTIC LOADER IS A SELF-CHECKING PROGRAM DESIGNED TO LOAD AND VERIFY LOADING OF CARD PROGRAMS PUNCHED IN 8-8 MODE. THE 8-8 MODE REFERS TO PROGRAM CARDS IN WHICH A CARD COLUMN CONTAINS A HALF WORD WHERE ONE FULL WORD CONSISTS OF SIXTEEN BITS. TWO CARD COLUMNS ARE REQUIRED FOR EACH WORD. THE LOADER DECK CONSISTS OF FIVE CARDS. THE FIRST CARD IS PUNCHED IN IPL-MODE FORMAT. CARDS TWO THROUGH FIVE ARE PUNCHED IN 8-8 MODE.

5.1 BASIC-LOADER FIRST-CARD FUNCTIONS

- 5.1.1 AFTER BEING LOADED IN IPL MODE, THE FIRST-CARD PROGRAM DEVELOPS A CHECKSUM TO DETERMINE IF IT WAS LOADED CORRECTLY. IF THE CHECKSUM IS NOT 0000, THE PROGRAM STOPS AT A WAIT WITH THE DEVELOPED CHECKSUM DISPLAYED BY THE ACCUMULATOR.
- 5.1.2 IF THE CHECKSUM IS CORRECT, THE FIRST-CARD PROGRAM PROCEEDS TO LOAD CARDS TWO THROUGH FIVE. TWO CARD COLUMNS WILL FORM ONE STORAGE WORD BECAUSE THESE CARDS ARE PUNCHED IN 8-8 MODE. THE DSW IS CHECKED, AND IF AN ERROR IS DETCTED, THE PROGRAM WILL STOP AT A WAIT WITH THE ERROR DSW DISPLAYED BY THE ACCUMULATOR. THE CONDITION CAUSING THE DSW ERROR MUST BE CORRECTED BEFORE ATTEMPTING TO RELOAD.

- 5.1.3 AFTER LOADING CARDS TWO THROUGH FIVE, THE PROGRAM BRANCHES TO BEGINNING OF PROGRAM JUST LOADED.

5.2 FUNCTIONS OF BASIC-LOADER CARDS TWO THROUGH FIVE

- 5.2.1 CARDS TWO THROUGH FIVE LOAD A MAIN-PROGRAM CARD INTO LOCATIONS 0010 TO 0036. THE DSW IS CHECKED AFTER READING A CARD COLUMN, AND IF AN ERROR OCCURRED, THE PROGRAM STOPS AT A WAIT WITH THE DSW ERROR DISPLAYED BY THE ACCUMULATOR.
- 5.2.2 CARDS TWO THROUGH FIVE ALSO DEVELOP CHECKSUM OF LOCATIONS 0010 THROUGH 0036. IF CHECKSUM IS OTHER THAN 0000, PROGRAM STOPS AT ERROR WAIT WITH CHECKSUM DISPLAYED BY ACCUMULATOR. A CORRECT CHECKSUM MEANS CARD WAS READ CORRECTLY.
- 5.2.3 THE WORD COUNT, (NUMBER OF WORDS ON THE CARD) IS TAKEN FROM LOCATION 0034. IF IT IS ZERO PROGRAM STOPS AT ERROR-WAIT.
- 5.2.4 THE NUMBER OF WORDS SPECIFIED IN LOCATION 0034 IS RELOCATED, STARTING AT THE ADDRESS THAT WAS SPECIFIED IN CARD COLUMNS 75 AND 76 AND THAT WAS READ INTO LOCATION 0035.
- 5.2.5 THE DATA READ AND THE DATA AT THE TRANSFERED LOCATION ARE COMPARED WORD BY WORD TO VERIFY THAT THE RELOCATION HAS BEEN DONE CORRECTLY. AN UNEQUAL COMPAPISON RESULTS IN THE PROGRAM STOPPING AT AN ENOV-WAIT INDICATING AN RELOCATION ERROR.
- 5.2.6 THE PROGRAM REPEATS THE STEPS DISCUSSED IN PARAGRAPHS 5.2.1 THROUGH 5.2.5 FOR EACH CARD OF THE MAIN PROGRAM DECK, EXCEPT FOR THE LAST CARD, WHICH MUST HAVE A LOCATION ADDRESS OF 0000. AFTER READING THE CARD AND DEVELOPING THE CHECKSUM, THE PROGRAM BRANCHES TO LOCATION 0010 AND STARTS EXECUTING THE MAIN LINE PROGRAM.

BASIC DIAGNOSTIC LOADER

6. APPENDIX

6.1 PUNCHED CARD 8-8 FORMAT

THE ORGANIZATION OF THE PUNCHED CARD 8-8 FORMAT IS AS FOLLOWS.

- A. COLUMNS 1 THROUGH 72 CONTAIN HALF WORDS (8 BITS) PUNCHED INTO ROWS 12 THROUGH 5. WORD-BITS 0 THROUGH 7 ARE PUNCHED INTO EVEN NUMBERED COLUMNS. WORD-BITS 8 THROUGH 15 ARE PUNCHED INTO ODD NUMBERED COLUMNS.
- B. COLUMNS 73 AND 74 CONTAIN A WORD-COUNT OF THE TOTAL NUMBER OF DATA WORDS PUNCHED INTO THE CARD.
- C. COLUMNS 75 AND 76 CONTAIN THE LOCATION, IN CORE WHERE THE DATA ON THE CARD ARE TO BE LOADED.
- D. COLUMNS 77 AND 78 CONTAIN A CHECKSUM (TWO'S COMPLEMENT OF THE SUM OF ALL WORDS IN COLUMNS 1 THROUGH 76).
- F. COLUMNS 79 AND 80 CONTAIN THE CARD'S SEQUENCE NUMBER PUNCHED IN HOLLERITH/HEXADECIMAL FORMAT.

BASIC DIAGNOSTIC LOADER
LIST FOR CARD ONE (1PL)

```
028C      ARS      CLD00000
          ORG      /0000 CLD00010
          *----- 1130 LOADER CARD 1 ----- CLD00020
          * LOAO WITH PROGRAM LOAD BUTTON
          *
0000 0 002C      START LD      RDIN+1  CORRECT 1/0 CONT. COMM. CLD00060
0001 0 1802      SRA      2          BY SHIFTING CLD00070
0002 0 002A      STO      ROIN+1 CLD00080
0003 0 0023      LO      STRD      CORRECT 1/0 CONT. COMM. CLD00090
0004 0 1801      SRA      1          BY SHIFTING AND CLD00100
0005 0 0021      STO      STRO      STORE WORD CLD00110
0006 0 0038      EOR      STORE      SET UP STORE LONG INST CLD00120
0007 0 0037      STO      STORE      PUT BACK INTO CORE. CLD00130
0008 0 0022      LD      SENSE      CORRECT 1/0 CONT. COMM. CLD00140
0009 0 1803      SRA      3          CLD00150
000A 0 0020      STO      SENSE      CLD00160
000B 0 0010      EOR      RESET      CLD00170
000C 0 001C      STO      RESET      CLD00180
000D 0 1805      SRA      5          MAKE STORE LONG INST. CLD00190
000E 0 0031      EOR      STORE+1 CLD00200
000F 0 0030      STO      STORE+1 CLD00210
0010 0 0017      LO      INTAD      CLD00220
0011 0 00F6      STO      /0008      CLD00230
0012 0 00F9      STO      /000C      CLD00240
          *
0013 0 0016      STRT LO      CHKSM      FORM CHECK SUM ,THIS CARO CLD00250
0014 0 8000      A      *          FROM 0015 THRU 0040 CLD00260
0015 0 0014      STO      CHKSM      CLD00270
0016 0 00FD      LD      STRT+1      CLD00280
0017 0 800E      A      K0001      CLD00290
0018 0 00F8      STO      STRT+1      CLD00300
0019 0 0008      EOR      CON1      CHECK THAT LAST LOC.CHECKO CLD00310
001A 0 4820      BSC      Z          SKIP WHEN OONE CLD00320
001B 0 70F7      MOX      STRT      GO GET NEXT WORD CLD00330
001C 0 000D      LO      CHKSM      GET SUM OF 0013 THRU 004F CLD00340
001D 0 482C      BSC      Z          -- SEE ACC IS 0000 IF SO GO CLD00350
001E 0 30F1      WAIT      -15      CHECK SUM ERROR CLD00360
001F 0 7010      ENDCK MDX      SRTRD      START LOADING CLD00370
          *
0020 0 8823      INT      DC      /B823 CLD00380
0021 0 0806      X10      RESET-1      SENSE AND RESET DSW CLD00390
0022 0 48F8      DC      /48F8      BOSC +-Z CLD00400
0023 0 0803      K0803 DC      /0803 CLD00410
0024 0 700E      MDX      PACK      CLD00420
          *
0025 0 8039      CON1 A      X /G039 CLD00430
0026 0 0001      K0001 OC      /0001 START RO,USEO AS CONSTANT CLD00440
0027 0 2808      STRD OC      /2808 /1404 SET BY PROG. CLD00450
0028 0 0020      INTAD DC      INT      RESET DSW CONTROL COMMAND CLD00460
0029 0 0003      RESET DC      /0003 /1703 SET BY PROGRAM CLD00470
002A 0 3829      CHKSM DC      /3829 SENSE DSW CONTROL COMMAND CLD00480
002B 0 8800      SENSE OC      /8800 /1700 SET BY PROGRAM CLD00490
002C 0 0000      ROIN DC      /0000 READ IN LOCATIONS 0+1 CLD00500
002D 0 4800      DC      /4800 /1200 SET BY PROGRAM CLD00510
          *
002E 0 0017      ERROR EOR      K0800 RESTORE ACC. TO DSW CLD00520
002F 0 30F2      WAIT      -14      **ERR. OSW IN ACC. CLD00530
          *
0030 0 08F5      SRTRD X10      STRD-1      START READ CLD00540
0031 0 08F6      X10      RESET-1      RESET DSW CLD00550
0032 0 08F7      X10      SENSE-1      SENSE DSW FOR CRP CLD00560
0033 0 0011      PACK EOR      K8003      BITS 0 + 14 + 15 ONLY CLD00570
0034 0 4820      BSC      7          SKIP IF BITS 0+14+15 ONLY CLD00580
0035 0 7011      MOX      CONT1      CONTINUE OSW ANALYSIS CLD00590
0036 0 08F5      X10      ROIN      RD COL. ONE-HALF WORD CLD00600
0037 0 00F4      LD      ROIN      CLD00610
0038 0 00ED      EOR      K0001      SWITCH READ IN AREA, EVEN CLD00620
0039 0 00F2      STO      RDIN      COLS. IN 0 000 IN 1 CLD00630
```

BASIC DIAGNOSTIC LOADER
LIST FOR CARD ONE (1PL)

```
003A 0 4820      BSC      Z          SKIP BOTH HALVES IN CLD00700
003B 0 70F5      MDX      SRTRD+1      GET 2ND HALF WORD CLD00710
003C 0 00C3      LO      START      GET LAST 8 BITS CLD00720
003D 0 1808      SRA      R          SHIFT IT CLD00730
003E 0 00C2      EOR      START+1      GET FIRST 8 BITS CLD00740
003F 0 0004      STORE DC      /C004      FIRST WORD OF STO L CLD00750
0040 0 00F7      DC      /00F7      2ND WORD OF STORE LONG CLD00760
          * STORE + STORE +1 CHANGED BY PROG9 TO STO L /004F CLD00770
0041 0 00FE      LD      STORE+1      CLD00780
0042 0 80E3      A      K0001      MODIFY STORE ADDRESS CLD00790
0043 0 00FC      STO      STORE+1      CLD00800
0044 0 70EC      MDX      SRTRD+1      CLD00810
          *
0045 0 8003      K8003 OC      /8003 CLD00820
0046 0 0800      K0800 DC      /0800 CLD00830
          *
0047 0 0003      CONT1 EOR      K8000      CHECK FOR BITS 14+15 ONLY CLD00840
0048 0 4820      BSC      Z          SKIP BUSY AND NOT READY CLD00850
0049 0 7002      MDX      CONT2      CLD00860
004A 0 70E7      MDX      SRTRD+2      CLD00870
004B 0 8000      K8000 OC      /8000 CLD00880
          *
004C 0 00D6      CONT2 EOR      K0803      CHECK FOR BIT 4 ONLY CLD00890
004D 0 4820      BSC      Z          SKIP END OF CARO CLD00900
004E 0 70DF      MDX      ERROR      CLD00910
004F 0 30F3      WAIT      -13      **ERR IF PRGM STOPS AT WAIT CLD00920
          *
          * CARD 2 IS READ IN AT THIS LOCATION WITH THE CLD00930
          * CHECK FOR READ OF 4 CAROS. CLD00940
          ENO      START      CLD00950
          CLD00960
          CLD00970
          CLD00980
          CLD00990
```

0050 0000

BASIC DIAGNOSTIC LOADER
LIST FOR CARDS TWO THROUGH FIVE

```
0081 0 1703      RESET DC      /1703      CLD01680
0082 0 0000      CKSUM DC      /0000      SENSE DSW CONTROL COMMAND CLD01690
0083 0 1700      SENSE DC      /1700      CLD01700
0084 0 0096      RDIN DC      RDEVN      READ COL. CONTROL COMMAND CLD01710
0085 0 1200      DC      /1200      CLD01720
0086 0 0000      RDEVN DC      /0000      CLD01730
0087 0 0000      RD0DD DC      /0000      CLD01740
0088 0 0034      K0034 DC      /0034      CLD01750
0089 0 0037      K0037 DC      /0037      CLD01760
008A 0 0800      K0800 DC      /0800      CLD01770
008B 0 8003      K8003 DC      /8003      CLD01780
008C 0 0010      K0010 DC      /0010      CLD01790
008D 0 8000      K8000 DC      /8000      CLD01800
008E 0 0097      CON1 STD X /0010-STORE-1 CLD01805
*
008F 0 0000      INT DC      0          CLD01810
0090 0 08EF      X10      PESET-1      SENSE AND RESET DSW CLD01820
0091 0 4878      8DSC      +-2          8R OUT OF INTERRUPT CLD01830
0092 0 0803      K0803 DC      /0803      CLD01840
0093 0 70CF      MOX      PACK          CLD01850
*
0094 0 F0F5      ERROR ENR K0800      RESTORE ACC TO DSW CLD01860
0095 0 30F4      WAIT      -12          **ERR. DSW IN ACC. CLD01870
0096 0 70C2      MDX      LOAD          PRESS START TO RETRY CLD01880
0097 0 F0F5      CONT1 FDR K8000      CHECK FOR BITS 14+15 ONLY CLD01890
0098 0 4820      BSC      Z          SKIP BUSY AND NOT READY CLD01900
0099 0 7005      MDX      CONT2        CLD01910
009A 0 70C7      MDX      SRTRD+2      CLD01920
*
* CARD 4 BEGINS HERE
*
0098      DRG      /009F
009F 0 F0F2      CDNT2 EOR K0803      CHECK FOR BIT 4 ONLY CLD01930
00A0 0 4820      BSC      Z          SKIP END OF CARD CLD01940
00A1 0 70F2      MDX      ERROR        CLD01950
*
*---CHECK FOR WORD COUNT OF ZERO---
*
00A2 0 C091      LD      /0034      GET WORD COUNT CLD01960
00A3 0 4820      BSC      Z          SKIP IF WORD COUNT ZERO CLD01970
00A4 0 7002      MOX      SUM1        CLD01980
00A5 0 30F5      WAIT      -11          **ERR. WORD COUNT IS ZERO CLD01990
00A6 0 7082      MDX      LOAD          START CONTINUES LOADING CLD02000
*
*---FORM CHECK SUM OF CARD IMAGE LOCS. 00-26---
*
00A7 0 C0E4      SUM1 LD      K0010      SET ACC. TO /0010 CLD02010
00A8 0 0004      STO      CKL00+1      CLD02020
00A9 0 1810      SRA      16          CLD02030
00AA 0 0007      STO      CKSUM        CLD02040
00AB 0 C0D6      LD      CKSUM        CLD02050
00AC 0 8400FFFF CKL00 A 1 /FFFF      FORM SUM OF LOCS. 10 THRU 36 CLD02060
00AE 0 D003      STO      CKSUM        CLD02070
00AF 0 C0F0      LD      CKL00+1      MODIFY ADDRESS CLD02080
00B0 0 80C0      A      K0001        CLD02090
00B1 0 00FB      STO      CKL00+1      CLD02100
00B2 0 F006      EDR      K0037      CHECK THAT ALL WORDS 00NE CLD02110
00B3 0 4820      BSC      Z          SKIP ALL LOCS. ADDED CLD02120
00B4 0 70F6      MDX      CKL00-1      CLD02130
00B5 0 C0CC      LO      CKSUM        LOAD SUM 10 THRU 36 CLD02140
00B6 0 4820      BSC      Z          SKIP SUM IS CORRECT CLD02150
00B7 0 30F6      WAIT      -10          **ERR. IN CHECK SUM CLD02160
*
* MOVE CARD IMAGE TO THE LOCS. BEGINING AT CLD02170
* THE ADDRESS GIVEN IN LOC. /0025.----- CLD02180
*
00B8 0 0  C4000035 MOVE LD 1 /0035      GET ADDRESS FOR FIRST WORD CLD02190
00BA 0 4820      BSC      Z          SKIP ADDRESS IS 0000 CLD02200
```

BASIC DIAGNOSTIC LOADER
LIST FOR CARDS TWO THROUGH FIVE

```
0088 0 7001      MDX      STRE      CLD02350
008C 0 70C0      MDX      HGP        CLD02360
008D 0 D00C      STRE STD PUT+1      SET FIRST WORD ADDRESS CLD02370
008E 0 C0CD      LD      K0010      SET ACC. EQU. 0010 CLD02380
008F 0 D001      STD      GET+1      SET TO GET FIRST WORD AT 0 CLD02390
00C0 0 C400FFFF GET LD L /FFFF      GET PROG. WORD CLD02400
00C2 0 7006      MDX      PUT        CLD02410
*
* CARD 5 BEGINS HERE
*
00C3      DRG      /00C7
00C7 0 7008      MDX MDX X LOAD-RSTRT-1 CLD02420
00C8 0 7013      MDX MDX X /0013      CLD02430
00C9 0 D400FFFF PUT STD L /FFFF      PUT PROG. WORD CLD02440
00C8 0 C0FE      LD      PUT+1      MODIFY PUT CLD02450
00CC 0 80A4      A      K0001        CLD02460
00CD 0 D0FC      STO      PUT+1      CLD02470
00CE 0 C0F2      LO      GET+1      MODIFY GET CLD02480
00CF 0 80A1      A      K0001        CLD02490
00D0 0 D0F0      STO      GET+1      CLD02500
00D1 0 F0B6      EOR      K0034      CHECK FOR ALL WORDS MOVED CLD02510
00D2 0 4820      BSC      Z          SKIP ALL WORDS MOVED CLD02520
00D3 0 70EC      MDX      GET        CLD02530
00D4 0 C4000035 SUM2 LD L /0035      GET ADDRESS OF FIRST WORD CLD02540
00D6 0 D003      STD      CKMOV+1      PUT IT INTO ROUTINE CLD02550
00D7 0 C084      LD      K0010      SET TO GET FIRST WORD OF CLD02560
00D8 0 D003      STO      COMP+1      IMAGE CLD02570
00D9 0 C400FFFF CKMOV LD L /FFFF      GET WORD MOVED CLD02580
00DA 0 F400FFFF CMP EOR L /FFFF      COMPARE WITH CARD IMAGE CLD02590
00DB 0 4820      BSC      Z          SKIP WORD STORED OK CLD02600
00DE 0 30F7      WAIT      -9          **ERR. WORD NOT STORED OK. CLD02610
00DF 0 C0FA      LD      CKMOV+1      MODIFY FOR NEXT WORD CLD02620
00E0 0 8090      A      K0001        CLD02630
00E1 0 D0F8      STO      CKMOV+1      CLD02640
00E2 0 C0F9      LD      COMP+1      MODIFY FOR NEXT COMPARE CLD02650
00E3 0 808D      A      K0001        CLD02660
00E4 0 D0F7      STO      CMP+1      CLD02670
00E5 0 F0A2      EOR      K0034      CHECK IF ALL 00NE CLD02680
00E6 0 4820      BSC      Z          SKIP ALL WORDS CHECKED CLD02690
00E7 0 70F1      MDX      CKMOV      CLD02700
00E8 0 708D      MDX      SUM1-1      GO GET NEXT CARD CLD02710
00EA 0 0059      END      LOAD      CLD02720
CLD02730
CLD02740
```


BASIC DIAGNOSTIC LOADER
LIST FOR CARDS TWO THROUGH FIVE

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CKLDD	00AC	00A8,00AF,00B1,00B4
CKMOV	0009	00D6,00DF,00E1,00E7
CKSUM	0082	00AA,00AB,00AE,00B5
COMP	00DB	00DB,00E2,00E4
CONT1	0097	0065
CONT2	009F	0099
CON1	008E	0059
CON2	007E	005B,006A
COUNT	0070	004F,0051
ERROR	0094	00A1
GET	00C0	008F,00CE,00D0,00D3
HDP	007D	00BC
INT	008F	0080
INTAD	0080	005D
K0001	0071	0050,0068,007A,0080,00CC,00CF,00E0,00E3
K0004	0072	0052
K0010	008C	00A7,00BE,00D7
K0034	0088	00D1,00E5
K0037	0089	00B2
K0800	008A	0094
K0803	0092	009F
K8000	008D	0097
K8003	008B	0063
LOAD	0059	0096,00CA,00C7,00E9
MDX	00C7	0055
MDX0	00C8	0057
MOVE	0088	
PACK	0063	0093
PUT	00C9	00BD,00C2,00CB,00CD
RDEVN	0086	006D,007E,0084
RDIN	0084	005C,0066,0067,0069
RDDDD	0087	0077
RESET	00B1	0061,0090
RSTRT	0050	0056,00C7
SENSE	0083	0062
SRTD	0060	006C,007C,009A
STORE	007B	005A,0079,007B,008E
STRD	007F	0060
STRE	008D	008B
SUM1	00A7	00A4,00E8
SUM2	00D4	

BASIC DIAGNOSTIC LOADER
PAPER TAPE BASIC LOADER

028C	ABS	ORG	LOAD WITH PROGRAM LOAD BUTTON	TDL00000
0000 0 7011	MDX	STRT		TDL00010
0001 0 0000	DC			TDL00020
0002 0 0000	DC			TDL00030
0003 0 0000	DC			TDL00040
0004 0 0000	DC			TDL00050
0005 0 0000	DC			TDL00060
0006 0 0000	DC			TDL00070
0007 0 0000	DC			TDL00080
0008 0 0000	DC			TDL00090
0009 0 0000	DC			TDL00100
000A 0 0000	DC			TDL00110
000B 0 0000	DC			TDL00120
000C 0 003A	DC	INT		TDL00130
000D 0 0000	DC			TDL00140
000E 0 0000	DC			TDL00150
000F 0 0000	DC			TDL00160
0010 0 0000	DC			TDL00170
0011 0 0000	DC			TDL00180
0012 0 C00D	STRT	LD	CHKSM	TDL00190
0013 00 84000000	A	L	FORM CHECK SUM	TDL00200
0015 0 D00A	STO	CHKSM		TDL00210
0016 0 C0FD	LD	STRT+2		TDL00220
0017 0 B064	A	K0001	MODIFY ADD INSTRUCTION	TDL00230
0018 0 D0F8	STO	STRT+2		TDL00240
0019 0 F007	ENR	LAST	CHECK THAT LAST LOC. CHECKD	TDL00250
001A 0 4B20	BSC	Z	SKIP WHEN 00NE	TDL00260
001B 0 70F6	MDX	STRT	GO GET NEXT WORD	TDL00270
001C 0 C003	LD	CHKSM	GET SUM OF 0000 THRU 00E8	TDL00280
001D 0 4B20	BSC	Z	SKIP IF CKSUM ZERO	TDL00290
001E 0 30F1	WAIT	-15	CKSUM ERROR	TDL00300
001F 0 7030	MDX	LOAD	START LOADING	TDL00310
0020 0 2D6E	CHKSM	DC		TDL00320
0021 0 00E9	LAST	DC		TDL00330
0022 0 FFFF	DC	/FFFF		TDL00340
0023 0 0000	DC			TDL00350
0024 0 0000	DC			TDL00360
0025 0 0000	DC			TDL00370
0026 0 0000	DC			TDL00380
0027 0 0000	DC			TDL00390
0028 0 0000	DC			TDL00400
0029 0 0000	DC			TDL00410
002A 0 0000	DC			TDL00420
002B 0 0000	DC			TDL00430
002C 0 0000	DC			TDL00440
002D 0 0000	DC			TDL00450
002E 0 0000	DC			TDL00460
002F 0 0000	DC			TDL00470
0030 0 0000	DC			TDL00480
0031 0 0000	DC			TDL00490
0032 0 0000	DC			TDL00500
0033 0 0000	DC			TDL00510
0034 0 0000	DC			TDL00520
0035 0 0000	DC			TDL00530
0036 0 0000	DC			TDL00540
0037 0 0000	DC			TDL00550
0038 0 0000	DC			TDL00560
0039 0 0000	DC			TDL00570
003A 0 0000	DC			TDL00580
003B 0 0842	INT	DC		TDL00590
003C 0 4B78	XIO	RESET.	SENSE AND RESET DSW	TDL00600
003D 0 0000	BDSC	+-Z	BR OUT OF INTERRUPT	TDL00610
003E 0 701F	DC	0		TDL00620
003F 0 0000	MDX	PACK		TDL00630
	DC			TDL00640
				TDL00650
				TDL00660
				TDL00670

BASIC DIAGNOSTIC LOADER
PAPER TAPE BASIC LOADER

```
0040 0 0000      DC
0041 0 0000      DC
0042 0 0000      DC
0043 0 009F      CON1 STO X /0010-STORE-1
0044 0 004E      CON2 DC RDEVN
0045 0 0028      CON3 DC 40
0046 0 7F00      DELET DC /7F00
0047 0 7D06      FIX MDX X Y-X-1
0048 0 C0ED      REF1X LD X RDEVN-X-1
0049 0 D000      WCNT DC 0
004A 0 4C00      K4C00 DC /4C00
004B 0 ECF0      KECF0 DC /ECF0 PUNCH BIT MASK
004C 0 0C0D      K0C00 DC /0C0D
004D 0 400D      K40DD DC /400D
004E 0 0000      RDEVN DC /D000
004F 0 0000      RD0DD DC /0000
*
0050 0 C0F2      LOAD LD CON1
0051 0 D01E      STO STORE RESTORE STORE INST.
0052 0 C0F1      LD CON2
0053 0 002E      STO RDIN RESTORE RDIN LOC.
0054 0 CDF0      LD CON3
0055 0 D0F3      STO WCNT
0056 0 CDF1      LD REF1X
0057 0 D008      STD X
*
0058 0 0823      SRTRD X10 K0001 START READ
0059 0 0826      X10 SENSE SENSE DSW
005A 0 EDFD      AND KECF0 MASK OUT PUNCH BITS
005B 0 F0F1      EOR K40DD
005C 0 4820      BSC Z SKIP IF COL. REQUEST
005D 0 7D39      MDX CONT1
*
005E 0 081F      PACK X10 RESET RESET DSW
005F 0 0822      X10 RDIN READ A COLUMN
0060 0 C0ED      X LD RDEVN
0061 0 90E4      S DELET
0062 0 4820      BSC Z
0063 0 7001      MDX **1
0064 0 70F3      MDX SRTRD
0065 0 C0E1      LD FIX
0066 0 D0F9      STO X
0067 0 C01A      Y LD RDIN SET NEXT READ IN LOCATION
0068 0 F013      EOR K00D1
0069 0 D018      STO RDIN
006A 0 F0D9      EOR CON2
006B 0 4820      BSC Z SKIP IF BOTH HALF WORDS IN
006C 0 70FB      MDX SRTRD
006D 0 C0E0      LD RDEVN COMBINE HALF WORDS
006E 0 1808      SRA 8
006F 0 F0DF      EOR RD0DD
*
0070 0 D09F      STORE STO /001D STORE FULL WORD
0071 0 CDFE      LD STORE SET NEXT WORD LOCATION
0072 0 8009      A K00D1
0073 0 D0FC      STO STORE
0074 0 C0D4      LD WCNT
0075 0 90D6      S K00D1
0076 0 D0D2      STO WCNT
0077 0 4820      BSC Z
0078 0 70DF      MDX SRTRD
0079 0 7028      MOX DATA
007A 0 7099      HMP MDX /0014 START PROGRAM
*
007B 0 0000      CKSUM DC /0000
007C 0 0001      K0001 DC /0001 READ CARD CONTROL COMMAND
007D 0 1C10      OC /1C10
007E 0 0000      RESET DC /0000 RESET DSW CONTROL COMMAND
```

BASIC DIAGNOSTIC LOADER
PAPER TAPE BASIC LOADER

```
007F 0 1F01      DC /1FD1
0080 0 0004      SENSE DC /0004 SENSE DSW CONTROL COMMAND
0081 0 1F00      DC /1F00
0082 0 004E      RDIN DC ROEVN READ COL. CONTROL COMMAND
0083 0 1A00      DC /1A00
0084 0 D037      K0037 DC /0037
0085 0 D034      K0D34 DC /D034
0086 0 D010      K0010 DC /0010
0087 0 D00D      DC
0088 0 D0D0      DC
0089 0 D000      DC
008A 0 00D0      DC
008B 0 D0D0      DC
008C 0 0DD0      DC
008D 0 D0D0      DC
008E 0 D000      DC
008F 0 D000      DC
0090 0 D0D0      DC
0091 0 0000      DC
0092 0 0000      DC
0093 0 00D0      DC
*
0094 0 F0B7      ERROR EOR K0C00 RESTORE ACC TO DSW
0095 0 30F4      WAIT -12 **ERR. DSW IN ACC.
0096 0 70C2      MDX SRTRD+1 PRESS START TO RETRY
*
0097 0 F0B2      CONT1 EOR K4C00 CHK BITS 4 AND 5 ONLY
0098 0 482D      BSC Z SKIP BUSY AND NOT READY
0099 0 70FA      MDX ERROR
009A 0 7DBE      MDX SRTRD+1
009B 0 00DD      DC
009C 0 0000      DC
009D 0 0000      DC
009E 0 0000      DC
009F 0 00D0      DC
00A0 0 0000      DC
00A1 0 0000      DC
*
*---CHECK FOR WORD COUNT OF ZERO---
*
00A2 0 C091      DATA LD /D034 GET WORD COUNT
00A3 0 4820      BSC Z SKIP IF WORD COUNT ZERO
00A4 0 7002      MDX SUM1
00A5 0 30F5      WAIT -11 **ERR. WORD COUNT IS ZERO
00A6 0 70A9      MDX LOAD START CONTINUES LOADING
*
*-----FORM CHECK SUM OF CARD IMAGE LOCS. 10-36-----
*
00A7 0 CODE      SUM1 LD K0D1D SET ACC. TO /0010
00A8 0 D004      STO CKL0D+1
00A9 0 1810      SRA 16
00AA 0 D0D0      STO CKSUM
00AB 0 C0CF      LD CKSUM
00AC 0 8400FFFF CKL0D A L /FFFF FORM SUM OF LOCS. 10 THRU 36
00AD 0 D0CC      STO CKSUM
00AE 0 C0FD      LD CKL0D+1 MODIFY ADDRESS
00B0 0 80CB      A K0001
00B1 0 D0FB      STO CKL0D+1
00B2 0 F0D1      EOR K0D37 CHECK THAT ALL WORDS DONE
00B3 0 4820      BSC Z SKIP ALL LOCS. ADDED
00B4 0 70F6      MDX CKL0D-1
00B5 0 C0C5      LD CKSUM LOAD SUM 10 THRU 36
00B6 0 4820      BSC Z SKIP SUM IS CORRECT
00B7 0 30F6      WAIT -10 **ERR. IN CHECK SUM
*
* MOVE CARD IMAGE TO THE LOCS. BEGINING AT
* THE ADDRESS GIVEN IN LOC. /0025.-----
*
```

BASIC DIAGNOSTIC LOADER
PAPER TAPE BASIC LOADER

00B8 00 C4000035	MOVE	LD	L	/D035	GET ADDRESS FOR FIRST WORD	TDL02040
00BA 0 4820		BSC	Z		SKIP ADDRESS IS D000	TDL02050
00BB 0 7001		MDX	STRE			TDL02060
00BC 0 708D		MDX	HOP		START PROGRAM VIA HOP	TDL02070
00BD 0 D00C	STRE	STD	PUT+1		SET FIRST WORD ADDRESS	TDL02080
00BE 0 CDC7		LD	K0D10		SET ACC. EQU. D010	TDL02090
00BF 0 D001		STD	GET+1		SET TO GET FIRST WORD AT 0	TDL02100
00C0 00 C400FFFF	GET	LO	L	/FFFF	GET PROG. WORD	TDL02110
00C2 0 7D06		MDX	PUT			TDL02120
	*					TDL02130
00C3 0 0D10		DC	/DD10			TDL02140
00C4 0 0000		DC				TDL02150
00C5 0 0000		DC				TDL02160
00C6 0 0000		DC				TDL02170
00C7 0 0000		DC				TDL02171
00C8 0 0000		DC				TDL02172
	*					TDL02180
00C9 00 D400FFFF	PUT	STD	L	/FFFF	PUT PROG. WORD	TDL02190
00CB 0 C0FE		LD	PUT+1		MODIFY PUT	TDL02200
00CC 0 80AF		A	K0001			TDL02210
00CD 0 D0FC		STD	PUT+1			TDL02220
00CE 0 C0F2		LD	GET+1		MODIFY GET	TDL02230
00CF 0 80AC		A	K00D1			TDL02240
00D0 0 D0F0		STD	GET+1			TDL02250
00D1 0 F0B3		EOR	K0034		CHECK FOR ALL WORDS MOVED	TDL02260
00D2 0 4820		BSC	Z		SKIP ALL WORDS MOVED	TDL02270
00D3 0 70EC		MDX	GET			TDL02280
00D4 00 C4000035	SUM2	LD	L	/D035	GET ADDRESS OF FIRST WORD	TDL02290
00D6 0 0003		STD	CKMOV+1		PUT IT INTO ROUTINE	TDL02300
00D7 0 C0AE		LD	K0010		SET TO GET FIRST WORD OF	TDL02310
00D8 0 D003		STD	COMP+1		IMAGE	TDL02320
00D9 00 C400FFFF	CKMOV	LD	L	/FFFF	GET WORD MOVED	TDL02330
00DB 00 F400FFFF	COMP	EOR	L	/FFFF	COMPARE WITH CARD IMAGE	TDL02340
00DD 0 4820		BSC	Z		SKIP WORD STORED OK	TDL02350
00DE 0 30F7		WAIT	-9		**ERR. WORD NOT STORED OK.	TDL02360
00DF 0 C0FA		LD	CKMOV+1		MODIFY FOR NEXT WORD	TDL02370
00E0 0 8098		A	K0001			TDL02380
00E1 D D0F8		STD	CKMOV+1			TDL02390
00E2 0 C0F9		LD	COMP+1		MODIFY FOR NEXT COMPARE	TDL02400
00E3 0 8098		A	K00D1			TDL02410
00E4 0 D0F7		STD	COMP+1			TDL02420
00E5 0 F09F		ENR	KDD34		CHECK IF ALL DONE	TDL02430
00E6 0 4820		BSC	Z		SKIP ALL WORDS CHECKED	TDL02440
00E7 0 70F1		MDX	CKMOV			TDL02450
00E8 0 708D		MDX	SUM1-1		GO GET NEXT CARD	TDL02460
00E9 0D00	END	BSS	0			TDL02470
DDEA 0050		END	LOAD			TDL02480

BASIC DIAGNOSTIC LOADER
PAPER TAPE BASIC LOADER

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CHKSM	0020	0012,0C15,D01C
CKLDD	00AC	00AB,DCAF,D0B1,00B4
CKMOV	00D9	00D6,00DF,00E1,00E7
CKSUM	0078	00AA,00AB,00AE,00B5
COMP	D0D8	00DB,00E2,00E4
CONT1	D097	005D
CON1	0043	D050
CON2	0044	0052,006A
CON3	0045	0054
DATA	D0A2	0079
DELET	D046	0061
END	00E9	0021
ERRDR	0094	0099
FIX	0047	D065
GET	00CD	00BF,D0CE,00DC,00D3
HOP	007A	008C
INT	D03A	000C
KECFD	0048	D05A
KOC00	004C	0094
K0001	007C	0017,0058,0068,0072,0075,00B0,D0CC,00CF,00E0,00E3
KDD10	00B6	00A7,00B2,D0D7
KD034	00B5	D0D1,00E5
KD037	00B4	00B2
K4CD0	D04A	D097
K40D0	D040	D05B
LAST	0021	0019
LOAD	0050	001F,00A6,00E9
MOVE	00B8	
PACK	005E	D03E
PUT	00C9	00BD,00C2,00CB,00CD
ROEVN	004F	D044,004B,0060,006D,0082
RDIN	0082	0053,005F,0067,0069
RDDDD	004F	006F
REFIX	0048	0056
RESET	D07E	D03B,D05E
SENSE	0080	D059
SRTRO	0058	D064,D06C,0078,0096,009A
STORE	0070	D043,0051,0071,0073
STRE	00BD	0087
STRT	D012	0000,0C16,D018,001B
SUM1	00A7	00A4,00E8
SUM2	0004	
WCNT	D049	D055,0074,0076
X	0060	0047,D04B,0057,0066
Y	0067	0047

TABLE OF CONTENTS

PAPAGRAPH	PAGE
1. PURPOSE	01A
2. PREREQUISITES.	01A
2.1 PROGRAM PREREQUISITES	
2.2 EQUIPMENT PREREQUISITES	
3. USE PROCEDURE	01A
3.1 GENERAL INFORMATION	
3.2 OPERATING PROCEDURE	
4. PRINTOUTS (NONE)	
5. COMMENTS.	04
5.1 FUNCTIONS OF ONE-CARD DIAGNOSTIC PROGRAMS	
5.2 DESCRIPTION OF ONE-CARD PROGRAMS	
6. APPENDIX.	06
6.1 DATA-PATH TEST PROGRAM	
6.1.1 TEST PROCEDURE	
6.1.2 PROGRAM DESCRIPTION	
6.2 ADD TEST PROGRAM	

LIST OF TABLES

TABLE	
1. NORMAL WAITS.	02
2. ERROR WAITS	03A

1. PURPOSE

THE ONE-CARD PROGRAMS ARE SHORT TESTS USED TO HELP ISOLATE FAILING FUNCTIONS THAT KEEP THE BASIC DIAGNOSTIC LOADER FROM OPERATING CORRECTLY. THERE ARE SEVEN ONE-CARD PROGRAMS, SEQUENCE NUMBERED 01 THROUGH 07 IN HOLLERITH - HEXADECIMAL CODE IN COLUMNS 79 AND 80. EACH PROGRAM IS RUN INDIVIDUALLY AND IS LOADED INTO CORE STORAGE USING THE PROGRAM LOAD MODE. REFER TO PARAGRAPH 5., COMMENTS, FOR PURPOSE AND DESCRIPTION OF EACH ONE-CARD PROGRAM.

INCLUDED IN THE APPENDIX, PARAGRAPHS 6.1 AND 6.2, ARE MANUAL ENTRY TEST PROGRAMS WHICH ARE LOADED BY MEANS OF THE CONSOLE ENTRY SWITCHES,. ONE PROGRAM IS A DATA PATH TEST, AND THE OTHER IS AN ADD TEST. THESE PROGRAMS PROVIDE ADDITIONAL AID IN ISOLATING MALFUNCTIONS.

2. PREREQUISITES

- 2.1 PROGRAM PREREQUISITES
NO ADDITIONAL PROGRAMS ARE REQUIRED.
- 2.2 EQUIPMENT PREREQUISITES
 - A. 1131 CENTRAL PROCESSING UNIT (CPU).
 - B. 1442 CARD READ/PUNCH OR PAPER TAPE.
 - C. 2501 CARD READER (USE ONLY CARDS 1-6) 7=ERROR.

3. USE PROCEDURE

3.1 GENERAL INFORMATION

THE FASTEST WAY TO ISOLATE A FAILURE WITH THE ONE-CARD PROGRAMS IS TO STEP THROUGH EACH ONE-CARD PROGRAM LOOKING FOR ONE OF THE ERROR CONDITIONS POSSIBLE.

THE POSSIBLE ERROR CONDITIONS ARE,

- A. STOP AT ERROR WAIT.
- B. INCORRECT REGISTER READINGS AT A NORMAL WAIT.
- C. FAILURE TO STOP AT A NORMAL WAIT.

IF THE ABOVE ERROR CONDITIONS DO NOT OCCUR, IT WILL BE NECESSARY TO RELY ON WHATEVER ERROR CONDITIONS APPEAR.

NORMAL WAITS-300X. NORMAL WAITS HAVE AS THEIR LAST DIGIT THE NUMBER OF THE ONE-CARD PROGRAM WHERE THEY OCCUR. FOR EXAMPLE WAIT 3003 IDENTIFIES A NORMAL WAIT IN ONE-CARD PROGRAM 03. WHEN A PROGRAM HAS MORE THAN ONE NORMAL WAIT, REFERENCE TO THE INSTRUCTION ADDRESS REGISTER READING IS NECESSARY, TO CORRECTLY IDENTIFY THE WAIT.

ERROR WAITS - 30FX. THE LAST DIGIT OF AN ERROR WAIT IDENTIFIES THE ONE-CARD PROGRAM WHERE WAIT OCCURS. THE NEXT TO LAST DIGIT, E, IDENTIFIES THE WAIT AS BEING AN ERROR WAIT. WHEN MORE THAN ONE ERROR WAIT OCCURS IN A ONE-CARD PROGRAM, REFERENCE TO THE INSTRUCTION ADDRESS REGISTER IS NECESSARY TO CORRECTLY IDENTIFY THE ERROR WAIT.

WHEN AN ERROR INDICATION OCCURS, THE LISTING OF THE PROGRAM BEING EXECUTED MUST BE REFERENCED TO DETERMINE THE CAUSE OF THE ERROR. CORRECT LOADING SHOULD BE VERIFIED BY DISPLAYING CONTENTS OF LOCATIONS WHERE THE PROGRAM IS STORED. THE PROGRAM SHOULD THEN BE RUN IN SI MODE TO LOCATE POINT OF FAILURE.

3.2 OPERATING PROCEDURE

- A. PLACE ALL SEVEN ONE-CARD PROGRAMS, FOLLOWED BY DECK OF BLANK CARDS IN 1442 HOPPER AND PRESS START BUTTON.
- B. CLEAR CORE STORAGE TO 33FF AS FOLLOWS,
- 1. SET MOOE SWITCH TO RUN.
 - 2. SET CONSOLE ENTRY SWITCHES TO 33FF.
 - 3. TURN ON STORAGE LOAD SWITCH (ON CE PANEL).
 - 4. PRESS START.
 - 5. PRESS IMM STOP.
 - 6. TURN OFF STORAGE LOAD SWITCH (ON CE PANEL).
- C. PRESS IMM STOP KEY.
- D. PRESS RESET KEY.
- E. PRESS PROGRAM LOAD.

ONE-CARD 01 SHOULD LOAD AND PROGRAM SHOULD STOP AT NORMAL WAIT 3001 (IAR = 0002). FROM THIS POINT ON, PROCEED ACCORDING TO INSTRUCTIONS GIVEN FOR THE WAIT THE PROGRAM HAS STOPPED AT. SEE TABLE 1 FOR NORMAL WAITS, AND TABLE 2 FOR ERROR WAITS.

TABLE 1. NORMAL WAITS

NOTE. IN THIS TABLE SBR=STORAGE BUFFER REG, IAR=INSTRUCTION ADDRESS REG, AND ACC=ACCUMULATOR.

***** WAITS *****		***** INDICATES / ACTION *****
SBR	IAR	

3001	0002	ACCUMULATOR SHOULD READ F0F0. IF OK PRESS START.
		IF NOT F0F0 ERROR IS INDICATED. REPAIR IF CAUSE IS CLEAR.
		IF NOT, CONTINUING TEST MAY HELP
3001	0004	ACCUMULATOR SHOULD READ 080F. IF OK PRESS START.
		IF NOT 080F ERROR IS INDICATED. REPAIR IF CAUSE IS CLEAR.
		IF NOT, CONTINUING TEST MAY HELP.
3001	004E	DEPRESS IMM STOP, RESET, AND PROGRAM LOAD BUTTONS TO LOAD CARD 02. FAILURE OF PROGRAM TO STOP AT THIS WAIT INDICATES FAILURE OF AN MDX OPERATION. STEPPING THROUGH PROGRAM IN SI MODE MAY HELP LOCATE FAILURE. IF CAUSE OF FAILURE IS CLEAR, REPAIR.
		IF THE FAILURE IS NOT CLEAR CONTINUING MAY HELP TO IDENTIFY THE FAILURE.
3002	003F	ACCUMULATOR SHOULD READ 003E. IF OK LOAD CARD 03 BY PRESSING IMM STOP, RESET, AND PROGRAM LOAD BUTTONS. IF ADD. IS NOT 003E, AN ERROR HAS OCCURRED. STEP THROUGH PROGRAM IN SING INST MODE, CHECKING THAT IAR AND ACC DISPLAY THE SAME INFORMATION AND ARE INCREMENTED BY ONE AT EACH STEP.
3003	0021	ACC SHOULD READ 0001. IF OK PRESS START.
		IF ACC IS NOT 0001, AN ERROR HAS OCCURED. STEP THROUGH PROGRAM IN SI MODE, CHECKING THAT (1) ACC CONTAINS A ONE IN BIT 0, (2) EACH SRA 1 INSTRUCTION IS EXECUTED PROPERLY, AND (3) NO BSC 2 CAUSES A SKIP UNLESS ACCUMULATOR EQUALS ZERO.

TABLE 1. NORMAL WAITS (CONTINUED)

***** WAITS *****		***** INDICATES / ACTION *****
SBR	IAR	

3003	0025	ACC SHOULD READ 0000. IF CK PRESS START.
		IF ACC IS NOT 0000, ERROR HAS OCCURRED. SI THROUGH PROGRAM FROM LOCATION 0021. COMPARE RESULTS OF TEST WITH LISTING.
3003	0030	ACC SHOULD READ 0F0F. IE CK PRESS START.
		IF ACC IS NOT 0F0F, ERROR HAS OCCURRED. SI THROUGH PROGRAM FROM LOCATION 0025. COMPARE RESULTS OF TEST WITH LISTING.
		CHECK FOR SINGLE-BIT OMISSION. TRY SWAPPING APPROPRIATE SLT CARDS. (SEE LISTING).
3003	0033	ACC SHOULD READ FFFF. IF CK PRESS START.
		IF ACC IS NOT FFFF, ERROR HAS OCCURRED. SI THROUGH PROGRAM FROM LOCATION 002E. COMPARE RESULTS OF TEST WITH LISTING.
3003	003C	ACC SHOULD READ FFEF. IF CK LOAD CARD 04 BY PRESSING IMM STOP, RESET, AND PROGRAM LOAD BUTTONS
		IF ACC IS NOT FFEF, ERROR HAS OCCURRED. SI THROUGH PROGRAM FROM LOCATION 002E. CCM RE RESULTS OF TEST WITH LISTING.
3004	001E	ACC SHOULD READ FFEF. IF CK PRESS START.
		IF ACC IS NOT FFEF, ERROR HAS OCCURRED. SI THROUGH PROGRAM. COMPARE RESULTS OF TEST WITH LISTING.
3004	0023	ACC SHOULD READ 0000. IF CK PRESS START.
		IF NO ERRORS OCCUR, THIS PROGRAM SHOULD RUN CONTINUOUSLY UNTIL STOPPED. IF NO ERRORS OCCUR, LOAD CARD 05 BY PRESSING IMM STOP, RESET, AND PROGRAM LOAD BUTTONS.
		IF ACC IS NOT 0000, ERROR HAS OCCURRED. SI THROUGH PROGRAM FROM LOCATION 001E. REFER TO LISTING.
3005	1000	PRESS RESET THEN START TO CONTINUE.
		MOST LIKELY ERROR WILL BE FAILURE OF PROGRAM TO STOP AT THIS WAIT. REFER TO LISTING. REFER TO PARAGRAPH 5.2.5 OF THIS DOCUMENT FOR DESCRIPTION OF CARD 05 PROGRAM.
3005	004C	ACC SHOULD READ 0FAF. IF OK LOAD CARD 06 BY PRESSING IMM STOP, RESET, AND PROGRAM LOAD BUTTONS.
		IF ACC IS NOT 0FAF, IT INDICATES THAT THE NUMBER OF LOCATIONS TESTED IS INCORRECT, ERROR MAY BE CAUSED BY ADD FAILURE, WHICH SHOULD BE DETECTABLE BY CARD 04 PROGRAM. PRESS START TO RESTART PROGRAM.

TABLE 1. NORMAL WAITS (CONTINUED)

***** WAITS *****		INDICATES / ACTION
SBR	IAR	
3006	002F	A. SET CONSOLE ENTRY SWITCHES TO 0003 (BUSY, NOT READY SIMULATED DSW). PRESS START. PROGRAM SHOULD RETURN TO THIS WAIT. IF OK PRESS START TO REPEAT TEST OR GO TO STEP B.
		IF PROGRAM STOPS AT WAIT B=30F6, REFER TO TABLE 2 - ERROR WAITS, FOR APPROPRIATE ACTION.
		B. SET CONSOLE ENTRY SWITCHES TO 0800 (END OF CARD SIMULATED DSW). PRESS START. PROGRAM SHOULD RETURN TO THIS WAIT. IF OK PRESS START TO REPEAT TEST, OR GO TO STEP C.
		IF PROGRAM STOPS AT WAIT B=30F6, REFER TO TABLE 2 - ERROR WAITS, FOR APPROPRIATE ACTION.
		C. SET CONSOLE ENTRY SWITCHES TO 8003 (COL. REQUEST, BUSY, NOT READY SIMULATED DSW). PRESS START. PROGRAM SHOULD RETURN TO THIS WAIT. IF OK PRESS START TO REPEAT TEST, OR GO TO STEP D.
		IF PROGRAM STOPS AT WAIT B=30F6, REFER TO TABLE 2 - ERROR WAITS, FOR APPROPRIATE ACTION.
		D. SET CONSOLE ENTRY SWITCHES TO AN INVALID DSW SETTING (OTHER THAN 0003, 0800, OR 8003). PRESS START. PROGRAM SHOULD STOP AT ERROR WAIT B=30F6, INDICATING THAT THE PROGRAM CORRECTLY SENSES AN ERROR DSW. PRESS START TO RETURN TO WAIT B=3006 (THIS WAIT) TO REPEAT TEST WITH SAME, OR DIFFERENT INVALID DSW.
		E. AFTER DETERMINING THAT CARD 06 PROGRAM REACTS CORRECTLY TO THE SIMULATED DSW'S, LOAD CARD 07 BY PRESSING IMM STOP, RESET, AND PROGRAM LOAD BUTTONS.
3007	0007	A. ACC AND ACC EXTENSION SHOULD READ FFFF. IF OK GO TO STEP B. IF NOT FFFF, LOAD DOUBLE OR ADD DOUBLE ERROR HAS OCCURRED. SI THROUGH PROGRAM. REFER TO LISTING.
		B. TURN ON INTERRUPT DELAY SWITCH (ON CF PANEL).
		C. PRESS START. BLANK CARDS SHOULD FFD CONTINUOUSLY THROUGH THE READ STATION OF THE 1442.
		*** NOTE ***
		THERE ARE NO OTHER WAITS IN CARD 07 PROGRAM IN ORDER TO PERMIT SCOPING OF X10 FUNCTIONS. CHANGE NO OP INSTRUCTION IN LOCATION 002C TO AN ERROR WAIT (30F7) TO CAUSE PROGRAM TO STOP ON ERROR DSW.
		D. PRESS STOP TO TERMINATE PROGRAM
		E. TURN OFF INTERRUPT DELAY SWITCH (ON CF PANEL).

TABLE 2. ERROR WAITS

NOTE. IN THIS TABLE SBR=STORAGE BUFFER REG, IAR=INSTRUCTION ADDRESS REG, AND ACC=ACCUMULATOR.

***** WAITS *****		INDICATES / ACTION
SBR	IAR	
30F1	0006	STOPPING AT ANY ONE OF THIS WAITS INDICATES FAILURE OF MOX TO OPERATION. SI THROUGH PROGRAM. IF FAILURE APPEARS AND ITS CAUSE IS CLEAR, REPAIR. IF CAUSE OF FAILURE IS NOT CLEAR, RUNNING ADDITIONAL ONE-CARD PROGRAMS MAY HELP IDENTIFY THE FAILURE.
30F3	0024	ACC NOT 0000 WHEN TESTED. SI THROUGH PROGRAM CHECKING THAT (1) ACC CONTAINS A ONE IN BIT 0, (2) EACH SRA 1 INSTRUCTION IS EXECUTED CORRECTLY, AND (3) A SKIP OCCURS WHEN ACC EQUALS 0000.
30F3	0036	ACC NOT 0000 WHEN TESTED. SI THROUGH PROGRAM FROM LOCATION 002F. COMPARE RESULTS OF TEST WITH LISTING.
30F4	0014	LDX LONG FAILURE. SI THROUGH PROGRAM. COMPARE RESULTS WITH LISTING.
30F4	002C	SUM OF SUMPL AND SUMMI IS NOT EQUAL TO 0000. IF THEIR SUM SHOULD EQUAL 0000, DIAGNOSE AND CORRECT TROUBLE. IF THEIR SUM SHOULD NOT BE 0000, RUN MANUAL-ENTRY ADD TEST (PARAGRAPH 6.2).
30F5	001E	SUM OF LOCATIONS 0014 THROUGH 004F IS NOT 0000. ACC CONTAINS OBTAINED SU. (1) RELOAD CARD 05, (2) RUN IN SI MODE THROUGH LOCATION 0010, (3) DISPLAY REMAINDER OF PROGRAM, AND (4) COMPARE RESULTS WITH LISTING.
		IF NO ERROR IS EVIDENT, SI THROUGH CHECKSUM LOOP (LOCATIONS 0012 THROUGH 001A).
		IF NO ERROR IS EVIDENT, (1) RELOAD CARD 05, (2) SI THROUGH LOCATION 0008, (3) INSERT WAIT OP IN LOCATION 0011, (4) SET 70F6 IN LOCATION 001A, AND (5) RUN CHECKSUM LOOP USING SI MODE FOR LOCATIONS 0011 AND 0013. VERIFY CHECKSUM ADDITION. REPAIR ANY FAILURES DISCOVERED.
30F5	003B	A LOCATION DOES NOT CONTAIN ITS OWN ADDRESS PLUS ONE. PERFORM FOLLOWING INSTRUCTION IN SI MODE. ADDRESS OF LOCATION IN ERROR WILL BE IN ACC. DISPLAY ERROR LOCATION. IT SHOULD CONTAIN ITS OWN ADDRESS PLUS ONE, AS A RESULT OF EXECUTING A BSI-1 AT THAT LOCATION. DIAGNOSE AND CORRECT.
30F6	002D	A. IF PROGRAM STOPS AT THIS WAIT FOLLOWING SETTING OF A VALID SIMULATED DSW IN CONSOLE ENTRY SWITCHES (0003, 0800, 8003). AN ERROR IN INTERPRETING THE DSW HAS OCCURRED. SI THROUGH PROGRAM AND REFER TO LISTING, TO LOCATE CAUSE OF ERROR.
		B. IF PROGRAM STOPS AT THIS WAIT AFTER SETTING AN INVALID IN THE CONSOLE ENTRY SWITCHES, THE PROGRAM OPERATED CORRECTLY. PRESS START TO RETURN TO NORMAL WAIT B=3006.

- 4. PRINTOUTS (NOT APPLICABLE)
- 5. COMMENTS

THE ONE-CARD DIAGNOSTIC PROGRAMS ARE DESIGNED TO HELP DIAGNOSE MALFUNCTIONS THAT OCCUR WHILE ATTEMPTING TO LOAD A PROGRAM WITH THE 1130 BASIC DIAGNOSTIC LOADER. THERE ARE SEVEN ONE-CARD PROGRAMS. EACH ONE-CARD PROGRAM TESTS A SPECIFIC FUNCTION OR GROUP OF FUNCTIONS. THE CARDS ARE NUMBERED FROM 01 THROUGH 07 IN HOLLERITH-HEXADECIMAL CODE IN COLUMNS 79 AND 80.

FUNCTIONS OF ONE-CARD DIAGNOSTIC PROGRAMS
THE SEVEN ONE-CARD PROGRAMS PERFORM THE FOLLOWING FUNCTIONS.

- A. CARD 01. TESTS MOX INSTRUCTION AND DATA TRANSFER FROM INSTRUCTION ADDRESS REGISTER TO ACCUMULATOR.
- B. CARD 02. EXECUTES A SIMPLE-ADDITION TEST AND TESTS INCREMENTING OF INSTRUCTION ADDRESS REGISTER.
- C. CARD 03. TESTS BSC Z, SRA 1, LD, STD, AND EOR INSTRUCTIONS AND DATA TRANSFER BETWEEN REGISTERS.
- D. CARD 04. TESTS LONG FORMAT OF LD, A, STO, LDX, EOR. TEST ADDITION OF POSITIVE AND NEGATIVE NUMBERS.
- E. CARD 05. TESTS ADDRESSING OF LOCATIONS 0050 THROUGH 00FE.
- F. CARD 06. DETERMINES WHETHER 1131 CPU CORRECTLY INTERPRETS SIMULATED OSW'S.
- G. CARD 07. TESTS LOAD DOUBLE AND ADD DOUBLE INSTRUCTIONS, AND SETS UP LOOPS TO ALLOW XIO FUNCTIONS TO BE CHECKED WITH AN OSCILLOSCOPE. XIO ROUTINES ARE DIAGNOSTIC LOADER BUT DO NOT STOP ON OSW ERROR.

5.2 DESCRIPTION OF ONE-CARD DIAGNOSTIC PROGRAMS

5.2.1. CARD-031 PROGRAM

THE CARD-01 PROGRAM LOADS ACCUMULATOR WITH F0F0 FROM LOCATION 0030 AND STOPS AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0002, STORAGE BUFFER INDICATING 3001, AND ACCUMULATOR INDICATING F0F0. FAILURE OF INDICATOR TO APPEAR AS DESCRIBED INDICATES A POSSIBLE READ-IN FAILURE DURING PROGRAM LOAD OR FAILURE OF THE LOAD-ACCUMULATOR INSTRUCTION. FOLLOWING DEPRESSION OF START PUSHBUTTON BY OPERATOR, PROGRAM LOADS ACCUMULATOR WITH 080F FROM LOCATION 0031 AND STOPS AT WAIT WITH INSTRUCTION ADDRESS INDICATING 0004, STORAGE BUFFER INDICATING 3001, AND ACCUMULATOR INDICATING 080F. AGAIN, FAILURE IF INDICATORS TO APPEAR AS DESCRIBED INDICATES POSSIBLE READ-IN FAILURE OR LOAD-ACCUMULATOR FAILURE. NEXT DEPRESSION OF START PUSHBUTTON, THE PROGRAM PERFORMS A SERIES OF MOX INSTRUCTIONS AND STOPS AT A WAIT WITH INSTRUCTION ADDRESS INDICATING 004E AND STORAGE BUFFER INDICATING 3001. IF PROGRAM STOPS AT ANY OTHER WAIT INSTRUCTION, AN MOX FAILURE IS INDICATED.

5.2.2 CARD-02 PROGRAM

THE CARD-02 PROGRAM TESTS ADD FUNCTION AND INCREMENTING OF STORAGE ADDRESS REGISTER. THE PROGRAM LOADS A CONSTANT OF 0001 IN ACCUMULATOR FROM LOCATION 003F AND CONTINUOUSLY ADDS THAT SAME CONSTANT UNTIL STOPPED BY WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 003E. THE ACCUMULATED TOTAL IS DISPLAYED BY ACCUMULATOR INDICATOR AND SHOULD BE 003E. ANY OTHER TOTAL INDICATES AN ADD-FUNCTION FAILURE OR INSTRUCTION ADDRESS REGISTER INCREMENT FAILURE

5.2.3 CARD-03 PROGRAM

- A. PART ONE TESTS THE SKIP-ON-ZERO OPERATION AND SHIFT-RIGHT-ONE OPERATION.
- B. PART TWO TESTS DATA TRANSFER BETWEEN REGISTERS AS FOLLOWS.
 - 1. DATA TRANSFER FROM STORAGE BUFFER REGISTER TO ARITHMETIC FACTOR REGISTER TO ACCUMULATOR REGISTER.
 - 2. DATA TRANSFER FROM ACCUMULATOR REGISTER TO ACCUMULATOR EXTENSION REGISTER AND BACK TO ACCUMULATOR REGISTER.
 - 3. DATA TRANSFER FROM ACCUMULATOR REGISTER TO STORAGE BUFFER REGISTER.

C. PART THREE TESTS OPERATION EOR FUNCTION.

PART ONE

PROGRAM SETS A 1 IN ACCUMULATOR-BIT 0 AND THEN TRIES TO SKIP-ON-ZERO. AS THE ACCUMULATOR IS NOT ZERO, PROGRAM FALLS THROUGH AND SHIFTS RIGHT ONE POSITION. TESTING FOR ZERO AND SHIFTING RIGHT ONE IS CONTINUED UNTIL PROGRAM IS STOPPED BY WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0021. THE ACCUMULATOR SHOULD INDICATE 0001. ANY OTHER ACCUMULATOR INDICATION INDICATES FAILURE OF SRA 1 OR BSC Z.

AFTER DEPRESSION OF START PUSHBUTTON, PROGRAM PERFORMS A SHIFT-RIGHT-ONE OPERATION, AND SKIPS-ON-ZERO TO A WAIT 0025, STORAGE BUFFER INDICATING 3003. ACCUMULATOR SHOULD INDICATE 0000.

PART TWO

UPON DEPRESSING START PUSHBUTTON, PROGRAM PERFORMS A SERIES OF ALTERNATE LD AND STO INSTRUCTIONS AND STOPS ON A WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0030 AND STORAGE BUFFER INDICATING 3003. ACCUMULATOR INDICATION SHOULD BE 0F0F, OR DATA-TRANSFER FAILURE IS INDICATED. FAILURE MAY BE OCCURRING DURING A LD OR STO INSTRUCTION.

PART THREE

PROGRAM TAKES ACCUMULATOR CONTENTS OF 0F0F LEFT AT END OF PART TWO AND PERFORMS EOR OPERATION WITH CONSTANT F0F0. THE FFFF RESULT IS STORED AT SYMBOLIC LOCATION KFFFF, AND PROGRAM STOPS ON WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0033. ACCUMULATOR INDICATOR SHOULD INDICATE FFFF, OR EOR FAILURE IS INDICATED.

AFTER DEPRESSING START PUSHBUTTON, PROGRAM PERFORMS EOR OF FFFF IN ACCUMULATOR WITH FFFF CONTAINED AT SYMBOLIC LOCATION KFFFF TO SET ACCUMULATOR TO 0000. A SKIP-ON-ZERO OPERATION IS THEN ATTEMPTED. IF EOP INSTRUCTION FAILS TO ZERO ACCUMULATOR, PROGRAM FALLS THROUGH TO AN ERROR WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0036, STORAGE BUFFER INDICATING 30F3. IF THE SKIP-ON-ZERO IS SUCCESSFULLY COMPLETED, THE PROGRAM PERFORMS EOR OF 0000 IN ACCUMULATOR AND 0000 AT SYMBOLIC LOCATION K0000. THE RESULTS OF EOR SHOULD BE 0000. PROGRAM TESTS THAT ACCUMULATOR IS 0000 BY ATTEMPTING SKIP-ON-ZERO. FAILURE TO SKIP STOPS PROGRAM AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0039, AND STORAGE BUFFER INDICATING 30F3, ACCUMULATOR INDICATOR SHOULD DISPLAY RESULT OF FAULTY EOR.

IF PROGRAM SKIPS, PROGRAM PERFORMS EOP OF 0000 IN ACC WITH CONSTANT F0F0 IN SYMBOLIC LOCATION K0F0F. ACC CONTENTS BECOME F0F0. ANOTHER EOR IS PERFORMED WITH CONSTANT 0F0F STORED IN HIGHEST STORAGE LOCATION. PROGRAM STOPS AT WAIT WITH IAR REG EQUAL 003C AND SBR REG EQUAL 3003. ACC SHOULD READ FFFF. ANY OTHER READING INDICATES EOP FAILURE.

5.2.4 CARD-04 PROGRAM

THE CARD-04 PROGRAM LONG FORMAT OF LD, A, STO, LDX, EDP. THEN THE CARD-04 PROGRAM LONG FORMAT OF LD, A, STD, LDX, EOR. THEN PART OF THE PROGRAM MAKES UP LONG FORM INSTRUCTIONS THEN PERFORMS AN LDX LONG OVER AN ERROR WAIT. THE ERROR WAIT WITH INSTRUCTION ADDRESS INDICATING 0014 AND THE STORAGE BUFFER INDICATING 30F4 SHOWS A FAILURE OF THE LDX LONG FORMAT.

LONG FORMAT FOR THE REMAINING TESTS ARE DONE WHEN THE PROGRAM MAKES UP CONSTANTS FFFF AND 0000. THESE CONSTANTS ARE DISPLAYED AT NORMAL WAITS. AT EACH OF THESE WAITS THE REGISTERS REFERENCED SHOULD BE CHECKED. IF THE REGISTERS ARE OK, START SHOULD BE PRESSED.

AFTER THE START IS PUSHED FOLLOWING THE SECOND NORMAL WAIT, THE ADD TEST IS STARTED. THE ADD TEST MUST BE STOPPED BY THE OPERATOR.

THE ADD LOOP PROGRAM ADDS A MINUS ONE (FFFF) TO SUMMI (SUM MINUS), ADDS A PLUS ONE (0001) TO SUMPL (SUM PLUS), AND ADDS SUMMI AND SUMPL. THE RESULTANT SUM, WHICH SHOULD BE 0000, IS USED TO CHECK FOR ERROR. IF THE SUM IS 0000, THE LOOP IS REPEATED, IF SUM IS NOT 0000, PROGRAM STOPS AT ERROR WAIT WITH IAR REG EQUAL 002C AND SBR REG EQUAL 30F4. ACC DISPLAYS ERROR SUM.

5.2.5 CARD-05 PROGRAM

TESTS ADDRESSING OF LOCATIONS 0050 THROUGH 0FFE. AFTER INITIAL SETUP, PROGRAM LOADS A WAIT INSTRUCTION AT LOCATION 0FFF AND LOADS A BRANCH TO SYMBOLIC LOCATION (CHECK) IN LOCATION 0000. THE PROGRAM FORMS A CHECKSUM OF LOCATIONS 0014 THROUGH 004F. IF CHECKSUM IS IN ERROR, PROGRAM STOPS AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 001F AND STORAGE BUFFER INDICATING 30F5. ACCUMULATOR INDICATOR DISPLAYS ERROR CHECKSUM.

IF CHECKSUM IS CORRECT PROGRAM LOADS A SERIES OF BSI -1 INSTRUCTIONS IN LOCATIONS 0050 THROUGH 0FFE AND BRANCHES TO LOCATION 055D TO EXECUTE THE BSI -1 CHAIN, WHICH CAUSES EACH LOCATION FROM 0050 THROUGH 0FFE TO CONTAIN ITS OWN ADDRESS PLUS ONE. THE PROGRAM THEN STOPS AT A WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 1000 AND STORAGE BUFFER INDICATING 3005. UPON DEPRESSION OF RESET AND START PUSHBUTTONS PROGRAM BRANCHES TO SYMBOLIC LOCATION (CHECK).

THE (CHECK) ROUTINE DETERMINES IF EACH LOCATION FROM 0050 THROUGH 0FFE CONTAINS ITS OWN ADDRESS PLUS ONE, KEEPS COUNT OF LOCATIONS TESTED, AND STOPS AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 004C AND STORAGE BUFFER INDICATING 3005. ACCUMULATOR SHOULD INDICATE 0FAF. IF THE CONTENTS OF A LOCATION ARE IN ERROR PROGRAM STOPS AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0038 AND STORAGE BUFFER INDICATING 30F5.

5.2.6 CARD-06 PROGRAM

THE CARD 06 PROGRAM CHECKS THE 1131 CPU FOR CORRECT RESPONSE TO A SIMULATED DSW. THE SIMULATED OSW IS SET IN THE CONSOLE ENTRY SWITCHES AND CAN BE A VALID OR INVALID DSW. PORTIONS OF THE CARD 06 PROGRAM DUPLICATE SECTIONS OF CARD 1 OF THE 1130 BASIC DIAGNOSTIC LOADER. THERE ARE THREE VALID OSW'S.

- A. 8003 BITS 0,14 AND 15 ON. COLUMN REQUESTS, BUSY, AND NOT READY.
- B. 0003 BITS 14 AND 15 ON. BUSY AND NOT READY.
- C. 0800 BIT 4 ON. END OF CARD (CP COMPLETE).

AFTER INITIAL SET UP, PROGRAM STOPS AT WAIT WITH IAR REG READING 002E AND SBR REG READING OF 3006, TO PERMIT OPERATOR TO ENTER A SIMULATED DSW IN THE CONSOLE ENTRY SWITCHES.

AFTER DEPRESSION OF START BUTTON, PROGRAM READS SETTING OF CONSOLE ENTRY SWITCHES INTO CORE AND THEN LOADS READING INTO ACC. IF THE READING IS 8003, THE PROGRAM REREADS THE SWITCHES AND STORES THE READING. PROGRAM BRANCHES BACK TO NORMAL WAIT 3006 TO PERMIT ENTRY OF DIFFERENT DSW IF DESIRED.

IF THE READING IS NOT 8003, PROGRAM CHECKS FOR READING OF 0003. IF TRUE, PROGRAM BRANCHES BACK TO NORMAL WAIT 3006 TO PERMIT ENTRY OF DIFFERENT DSW. IF 8003 READING IS NOT TRUE, PROGRAM READS CONSOLE SWITCHES AND CHECKS FOR ENTRY 0800. IF TRUE, PROGRAM ADDS 1 TO SUM WORD (WHICH CONTAINS NUMBER OF)800 CONDITIONS ENCOUNTERED 0. PROGRAM THEN BRANCHES TO NORMAL WAIT 3006 TO PERMIT ENTRY OF NEW DSW. IF 0800 CONDITION IS NOT TRUE, PROGRAM STOPS AT ERROR WAIT WITH IAR REG READING OF 0020. ACC DISPLAYS ERROR OSW. PRESSING START BRANCHES PROGRAM TO NORMAL WAIT 3006 TO PERMIT ENTRY OF NEW DSW. IF IT IS DESIRED TO LOOP PROGRAM ON A SINGLE DSW, THE NORMAL WAIT THAT PERMITS ENTRY OF OSW'S, MAY BE CHANGED TO A NO DP (7000).

5.2.7 CARD-07 PROGRAM

PART ONE OF CARD 07 PROGRAM TESTS LOAD DOUBLE AND ADD DOUBLE INSTRUCTIONS. AT THE END OF THE TEST, PROGRAM STOPS AT NORMAL WAIT 3007, WITH IAR READING OF 0006. THE ACCUMULATOR AND ACCUMULATOR EXTENSION SHOULD READ FFFF, OR AN ERROR IS INDICATED. PRIOR TO DEPRESSING THE START KEY TO CONTINUE TO PART TWO, OPERATOR MUST TURN ON THE INTERRUPT DELAY SWITCH ON THE CE PANEL.

PART TWO OF CARD 07 PROGRAM IS DESIGNED TO PERMIT SCOPING OF THE XIO FUNCTIONS, WHILE CONTINUOUSLY READING CARDS WITH THE 1442. THE READ-CARD ROUTINE IS A DUPLICATE OF READ-CARD ROUTING IN CARD 1 OF THE 1130 BASIC DIAGNOSTIC LOADER.

AFTER INITIAL SET UP, PROGRAM CAUSES CARD TO FEED, RESET OSW, AND SENSE DSW. IT THEN CHECKS DSW FOR A 8003 INDICATION. IF TRUE, PROGRAM READS CARD COLUMN INTO LOCATION 0000 OR 0001. ODD NUMBERED COLUMNS ARE READ INTO LOCATION 0001. EVEN NUMBERED CARD COLUMNS ARE READ INTO LOCATION 0000. PROGRAM THEN LOADS ACC FROM LOCATION JUST LOADED, AND BRANCHES BACK TO RESET AND SENSE DSW, AND CHECK FOR 8003 DSW AGAIN.

IF DSW IS NOT 8003, THE PROGRAM CHECKS FOR A 0003 DSW. IF TRUE, PROGRAM BRANCHES BACK TO SENSE DSW AND CHECK FOR 8003 DSW. PROGRAM WILL REMAIN IN THIS CLOSED LOOP UNTIL THE 8003 CONDITION IS TRUE OR THE 0003 CONDITION IS NOT TRUE. WHEN THE PROGRAM FINDS THE 0003 CONDITION NOT TRUE, IT SENSES AND RESETS THE OSW AND CHECKS FOR 0800 CONDITION. IF TRUE, PROGRAM BRANCHES TO START ANOTHER CARD FEEDING AND REPEATS THE ENTIRE PROCESS. IF 0003 IS NOT TRUE, PROGRAM WILL AGAIN BRANCH TO START ANOTHER CARD FEEDING. THE OPERATOR HAS AN OPTION TO STOP THE PROGRAM AT LOCATION 002C BY INSERTING A WAIT.

6. APPENDIX

6.1 DATA PATH TEST PROGRAM

THIS PROGRAM IS LOADED USING THE CONSOLE ENTRY SWITCHES AND TESTS THE ABILITY OF THE 1131 CPU TO TRANSFER ONES AND ZEROS BETWEEN THE FOLLOWING REGISTERS.

- A. FROM STORAGE BUFFER REGISTER TO ARITHMETIC FACTOR REGISTER TO ACCUMULATOR REGISTER TO STORAGE ADDRESS REGISTER TO INSTRUCTION ADDRESS REGISTER.
- B. FROM ACCUMULATOR REGISTER TO ACCUMULATOR EXTENSION REGISTER TO ACCUMULATOR REGISTER.
- C. FROM ACCUMULATOR REGISTER TO STORAGE BUFFER REGISTER.
- D. FROM INSTRUCTION ADDRESS REGISTER TO STORAGE BUFFER REGISTER.
- E. FROM INSTRUCTION ADDRESS REGISTER TO ACCUMULATOR REGISTER.

6.1.1 TEST PROCEDURE

- A. CLEAR STORAGE TO WAIT INSTRUCTION 33FF. SEE PARAGRAPH 3.3.6.
- B. ENTER THE FOLLOWING PROGRAM USING CONSOLE ENTRY SWITCHES.

NOTE

ALL NUMBERS SHOWN BELOW ARE IN HEXADECIMAL NOTATION.

LOCATION	CONTENT	MNEMONIC	COMMENTS
FFFA	0006	LD	LOAD ACCUMULATOR WITH CONTENTS OF LOCATION 0001.
FFFB	4480	BSI I	STORE CONTENTS OF I COUNTER (FFFF) AT ADDRESS STORED IN LOCATION FFFD. SET I COUNTER TO THAT ADDRESS AND ADD ONE TO I COUNTER.
FFFC	FFFF		ADDRESS POSITION OF BSI I INSTRUCTION.
FFFD	FFFF		THIS IS THE ACTUAL BRANCH ADDRESS FOR THE THE BSI I INSTRUCTION AND IS REPLACED BY THE BSI I.
FFFE	0002	STO	STORE CONTENTS OF ACCUMULATOR AT LOCATION 0001 (SHOULD NOT CHANGE).
FFFF	00FC	LD	LOAD ACCUMULATOR WITH CONTENTS OF LOCATION FFFC.
0000	4480	BSI I	STORE CONTENTS OF I COUNTER (0002) AT ADDRESS STORED IN LOCATION 0002. SET I COUNTER TO THAT ADDRESS AND ADD ONE TO I COUNTER.
0001	0002		THIS IS ADDRESS POSITION OF BSI I INSTRUCTION.
0002	0002		THIS IS THE ACTUAL BRANCH ADDRESS FOR THE BSI I INSTRUCTION AND IS REPLACED BY THE BSI I INSTRUCTION.
0003	00F8	STO	STORE CONTENTS OF ACCUMULATOR AT LOCATION FFFC (SHOULD NOT CHANGE).
0004	70F5	MDX	BRANCH TO LOCATION FFFA.
C. LOAD INSTRUCTION ADDRESS REGISTER WITH FFFA.			
D. STEP THROUGH PROGRAM IN SI MODE, CHECKING THAT PROGRAM LOOPS PROPERLY. ANY DATA-PATH ERROR SHOULD RESULT IN THE IMPROPER BRANCHING OF A BSI I INSTRUCTION AND STOPPING AT A WAIT. THE LOCATION BEFORE THE WAIT SHOULD CONTAIN THE CONTENTS OF INSTRUCTION ADDRESS REGISTER WHEN THE BRANCH OCCURRED. LOGICAL RECONSTRUCTION OF THE ERROR SHOULD ISOLATE A DATA-TRANSFER ERROR AND SUGGEST THE CIRCUIT CARD CAUSING THE ERROR.			

NOTE

A BRANCH OUTSIDE OF THE PROGRAM INTO A CORE LOCATION LOADED WITH 33FF INDICATES AN ERROR HAS OCCURRED. SUBTRACT TWO FROM INSTRUCTION ADDRESS INDICATOR READING AND DISPLAY LOCATION. THE CONTENT OF LOCATION DISPLAYED IS THE INSTRUCTION ADDRESS REGISTER SETTING WHEN THE ERROREDUS BRANCH OCCURRED. IF THE BRANCH WAS CAUSED BY A BSI I INSTRUCTION FAILURE, THE LOCATION JUST CHECKED WILL HAVE A VALUE HIGHER BY ONE THAN THE ADDRESS OF THE SECOND WORD OF THE BSI I INSTRUCTION. IF THIS IS THE CASE, DISPLAY LOCATIONS WHERE PROGRAM IS STORED TO DETERMINE IF THE LOCATIONS HAVE CHANGED. THE ADDRESSES OF BSI I INSTRUCTIONS ARE STORED BY THE STO INSTRUCTIONS, AND THE LOCATIONS FFFD AND 0002 ARE STORED BY THE BSI I INSTRUCTIONS. STATIC OR INTERMITTENT DATA TRANSFER ERRORS SHOULD BE READILY DETECTED BY THIS MEANS AND BE EASY TO ISOLATE BECAUSE OF THE UNIQUE FAILURE INDICATIONS.

ERRORS IN THE DATA PATH PROGRAM SHOULD BE CAUSED BY SINGLE BIT FAILURES, OR BY HALF-WORD FAILURES. THUS, DROPPED OR ADDED BITS CAN BE REFERENCED DIRECTLY TO A CIRCUIT CARD. SWAP INDICATED CIRCUIT CARD TO SEE IF FAILURE CHANGES.

THE Q, U, A, AND F REGISTERS' CIRCUIT CARDS ARE LOCATED IN ROW 4 OF THE CARD GATE, AND ARE INTERCHANGEABLE.

THE I, B, AND M REGISTERS' CIRCUIT CARDS ARE LOCATED IN ROW 6 OF THE CARD GATE, AND ARE INTERCHANGEABLE.

FAILING BIT- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
COLUMN----- B C D E F H J K L

THE FOLLOWING CARDS CONTROL HALF-WORD TRANSFERS AND ARE INTERCHANGEABLE.

M4, M5, M7, L5, AND L6.

6.1.2 PROGRAM DESCRIPTION

THE LD INSTRUCTION AT LOCATION FFFA PERFORMS THE FUNCTION OF SETTING THE ACCUMULATOR TO 0002 SO THAT WHEN THE FOLLOWING BSI I INSTRUCTION IS PERFORMED, A COMPLEMENT BIT PATTERN (FFFD) WILL BE SENT THROUGH THE ACCUMULATOR, THUS TESTING THAT THE ACCUMULATOR IS RETURNED TO 0002 AT THE END OF THE BSI I INSTRUCTION. THIS TEST IS ACCOMPLISHED BY STORING THE CONTENTS OF THE ACCUMULATOR BACK INTO LOCATION 0001 AFTER THE BSI I INSTRUCTION. THE SAME PHILOSOPHY IS USED DURING THE BSI I INSTRUCTION AT LOCATION 00000 BY SETTING THE ACCUMULATOR TO FFFD WHILE 0002 IS SENT THROUGH IT DURING THE BSI I INSTRUCTION. A FAILURE OF EITHER BSI I INSTRUCTION THAT AFFECTS THE ACCUMULATOR WILL CAUSE THE FOLLOWING BSI I INSTRUCTION TO TAKE ITS ADDRESS FROM THE WRONG LOCATION. THIS LOCATION WILL PROBABLY BE ONE OF THE CORE LOCATIONS LOADED WITH 33FF, THUS CAUSING THE PROGRAM TO STOP.

6.2 ADD TEST PROGRAM

THIS PROGRAM HELPS LOCATE AN ADD FAILURE THAT CANNOT BE LOCATED WHEN RUNNING CARD 04 OF ONE-CARD PROGRAMS IN SI MODE, BECAUSE OF THE DYNAMIC NATURE OF THE PROBLEM. IF THE CONTENTS OF SUMPL AND SUMMI DO NOT ADD TO 0000, THERE HAS BEEN A FAILURE IN ADDING 0001 TO SUMPL, OR A FAILURE IN ADDING FFFF TO SUMMI. TO DETERMINE WHICH OF THE TWO SUMS IS IN ERROR, IT MUST BE ASSUMED THAT ONE OF THEM IS CORRECT IN ORDER TO ARRIVE AT THE VALUE OF THE OTHER PRIOR TO THE FAILURE, IN OTHER WORDS, TO DETERMINE VALUE OF SUMPL PRIOR TO FAILURE. IT MUST BE ASSUMED THAT PRESENT VALUE OF SUMMI IS CORRECT AND VICEVERSA. EXECUTE ADD TEST PROGRAM AS FOLLOWS,

- A. OBTAIN VALUE OF SUMPL PRIOR TO FAILURE BY DETERMINING TWO'S COMPLEMENT OF (SUMMI - FFFF).
- B. OBTAIN VALUE OF SUMMI PRIOR TO FAILURE BY DETERMINING TWO'S COMPLEMENT OF (SUMPL - 0001).
- C. LOAD FOLLOWING PROGRAM BY MEANS OF CONSOLE ENTRY SWITCHES.

NOTE

ALL NUMBERS SHOWN BELOW ARE IN HEXADECIMAL NOTATION.

LOCATION	CONTENTS	MNEMONIC	COMMENTS
0000	VALUE OF SUMPL PRIOR TO ERROR		WILL BE IN ACCUMULATOR WHEN ADD OCCURS.
0001	0001		WILL BE ADDED TO ACCUMULATOR DURING ADD.
0002	CORRECT SUM OF ADDITION		USED TO CHECK ADD OPERATION.
0003	00FC	LD	LOAD ACCUMULATION FROM LOCATION 0000.
0004	80FC	A	ADD CONTENTS OF LOCATION 0001 TO ACCUMULATOR.
0005	F0FC	EOR	EOR ACCUMULATOR WITH CORRECT ANSWER.
0006	4820	BSC Z	SKIP ON ZERO TO LOCATION 0008.
0007	3000	WAIT	WAIT ON ERROR HAS OCCURRED.
0008	6003	LDX	BRANCH TO LOCATION 0003.

- D. LOAD INSTRUCTION ADDRESS REGISTER WITH 0003.
- E. RUN PROGRAM IN RUN MODE. ANY ADD FAILURE WILL CAUSE PROGRAM TO STOP AT WAIT INSTRUCTION WITH INSTRUCTION ADDRESS INDICATING 0008.
- F. IF PROGRAM RUNS CONTINUOUSLY WITHOUT ERRORS.
 - 1. PRESS STOP PUSHBUTTON.
 - 2. LOAD LOCATION 0000 WITH VALUE OF SUMMI PRIOR TO ERROR.
 - 3. LOAD LOCATION 0001 WITH FFFF.
 - 4. LOAD LOCATION 0002 WITH CORRECT SUM OF SUMMI PLUS FFFF.
 - 5. RUN AGAIN IN RUN MODE.

----- LAST PAGE -----

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 01

```
028C      A8S
          ORG      0
          * TEST MDX AND 1 TO A TRANSFER
          *      TEST READ IN ON PROG. LOAD.
0000 0 002F      LD      /0030
0001 0 0001      WAIT    /0001  --SEE ACC IS F0F0
0002 0 002E      LD      /0031
0003 0 0001      WAIT    /0001  --SEE ACC IS 080F
0004 0 003F      MDX     /0044
0005 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0006 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0007 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0008 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0009 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000A 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000B 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000C 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000D 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000E 0 00F1      WAIT    -15    **ERR., RESET THEN SI
000F 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0010 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0011 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0012 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0013 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0014 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0015 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0016 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0017 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0018 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0019 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001A 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001B 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001C 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001D 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001E 0 00F1      WAIT    -15    **ERR., RESET THEN SI
001F 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0020 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0021 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0022 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0023 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0024 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0025 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0026 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0027 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0028 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0029 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002A 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002B 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002C 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002D 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002E 0 00F1      WAIT    -15    **ERR., RESET THEN SI
002F 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0030 0 00F0      OC      /F0F0
0031 0 080F      OC      /080F
0032 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0033 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0034 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0035 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0036 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0037 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0038 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0039 0 00F1      WAIT    -15    **ERR., RESET THEN SI
003A 0 00F1      WAIT    -15    **ERR., RESET THEN SI
003B 0 00F1      WAIT    -15    **ERR., RESET THEN SI
003C 0 00F1      WAIT    -15    **ERR., RESET THEN SI
003D 0 00F1      WAIT    -15    **ERR., RESET THEN SI
003E 0 0000      MDX     *
003F 0 0000      MDX     /0040
```

```
000020
000030
000040
000050
000060
000070
000080
000090
000100
000110
000120
000130
000140
000150
000160
000170
000180
000190
000200
000210
000220
000230
000240
000250
000260
000270
000280
000290
000300
000310
000320
000330
000340
000350
000360
000370
000380
000390
000400
000410
000420
000430
000440
000450
000460
000470
000480
000490
000500
000510
000520
000530
000540
000550
000560
000570
000580
000590
000600
000610
000620
000630
000640
000650
000660
000670
000680
000690
```

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 01

```
0040 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0041 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0042 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0043 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0044 0 00F9      MOX     /003E
0045 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0046 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0047 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0048 0 00F1      WAIT    -15    **ERR., RESET THEN SI
0049 0 00F1      WAIT    -15    **ERR., RESET THEN SI
004A 0 00F1      WAIT    -15    **ERR., RESET THEN SI
004B 0 00F1      WAIT    -15    **ERR., RESET THEN SI
004C 0 00F1      WAIT    -15    **ERR., RESET THEN SI
004D 0 0001      WAIT    /0001  --STOP HERE INDICATES OK
004E 0 2000      DC      /2000  HEXIDECIMAL NUMBER 0
004F 0 1000      OC      /1000  HEXIDECIMAL NUMBER 1
0050 0000      ENO      0
000700
000710
000720
000730
000740
000750
000760
000770
000780
000790
000800
000810
000820
000830
000840
000850
000860
```

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 01

CROSS REFERENCE LISTING

SYMBOL VALUE REFERENCES

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 02

028C	ABS	ORG	0000	000890
0000 0 003E	* TEST	ADD BY	ONE AND INCREMENT I COUNTER	000900
0001 0 803D	LO	/003F	ADD /0001 TO ACC. AT EACH	000910
0002 0 803C	A	/003F	INST. FROM LOC. /0000	000920
0003 0 803B	A	/003F	TO LOC. /003E. TOTAL	000930
0004 0 803A	A	/003F	AT WAIT AT /003F SHOULD	000940
0005 0 8039	A	/003F	BE /003E.	000950
0006 0 8038	A	/003F	IF ANSWER WRONG	000960
0007 0 8037	A	/003F	1. DISPLAY LOCS. /003F	000970
0008 0 8036	A	/003F		000980
0009 0 8035	A	/003F		000990
000A 0 8034	A	/003F		001000
000B 0 8033	A	/003F		001010
000C 0 8032	A	/003F		001020
000D 0 8031	A	/003F	2. LOAD OK. CHECK THE	001030
000E 0 8030	A	/003F	FOLLOWING CAROS	001040
000F 0 802F	A	/003F	BY SWAP + RE-RUN	001050
0010 0 802E	A	/003F	QUAD + IBM.	001060
0011 0 802D	A	/003F	OR SINGLE INSTRUCTION	001070
0012 0 802C	A	/003F	FROM 70000 + SEE	001080
0013 0 802B	A	/003F	WHEN ACC. NOT EQU.	001090
0014 0 802A	A	/003F	I COUNTER.	001100
0015 0 8029	A	/003F		001110
0016 0 8028	A	/003F		001120
0017 0 8027	A	/003F		001130
0018 0 8026	A	/003F		001140
0019 0 8025	A	/003F		001150
001A 0 8024	A	/003F		001160
001B 0 8023	A	/003F		001170
001C 0 8022	A	/003F		001180
001D 0 8021	A	/003F		001190
001E 0 8020	A	/003F		001200
001F 0 801F	A	/003F		001210
0020 0 801E	A	/003F		001220
0021 0 801D	A	/003F		001230
0022 0 801C	A	/003F		001240
0023 0 801B	A	/003F		001250
0024 0 801A	A	/003F		001260
0025 0 8019	A	/003F		001270
0026 0 8018	A	/003F		001280
0027 0 8017	A	/003F		001290
0028 0 8016	A	/003F		001300
0029 0 8015	A	/003F		001310
002A 0 8014	A	/003F		001320
002B 0 8013	A	/003F		001330
002C 0 8012	A	/003F		001340
002D 0 8011	A	/003F		001350
002E 0 8010	A	/003F		001360
002F 0 800F	A	/003F		001370
0030 0 800E	A	/003F		001380
0031 0 800D	A	/003F		001390
0032 0 800C	A	/003F		001400
0033 0 800B	A	/003F		001410
0034 0 800A	A	/003F		001420
0035 0 8009	A	/003F		001430
0036 0 8008	A	/003F		001440
0037 0 8007	A	/003F		001450
0038 0 8006	A	/003F		001460
0039 0 8005	A	/003F		001470
003A 0 8004	A	/003F		001480
003B 0 8003	A	/003F		001490
003C 0 8002	A	/003F		001500
003D 0 8001	A	/003F		001510
003E 0 3002	WAIT	/0002	--SEE ACC. IS 003E	001520
003F 0 0001	DC	/0001	CONSTANT ADDED AT 0-30	001530
0040 0 F8FF	OC	/F8FF	CONSTANT TO CHECK CRO READ	001540
				001550
				001560

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 02

0041	000D	BSS	/D	
004E 0	2000	DC	/2000	HEXIDECIMAL NUMBER 0
004F 0	0800	DC	/0800	HEXIDECIMAL NUMBER 2
0050	0000	END	0	

001570
001580
001590
001600

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 02

CROSS REFERENCE LISTING

SYMBOL VALUE REFERENCES

ONE-CARD DIAGNOSTIC PROGRAMS
CARO 03

028C ABS
 ORG /0000
* CHECK BSC Z, SRA 1, AND EOR.
* LOAD CARO AND RUN PROGRAM. PROGRAM SHOULD STOP
* AT WAITS FOLLOWED BY -- FOR SEEING THAT THE REGS.
* SHOWN ARE CORRECT, DIFFERENCES INDICATE ERRORS.
* WAITS FOLLOWED BY ** OCCUR ONLY ON ERRORS.
* THE FIRST TEST IS OF SRA 1 AND BSC Z.
* A ONE IS PLACED INTO THE BIT ZERO POSITION AND
* TESTED AT EACH TIME BY A BSC Z WHICH SHOULD NOT
* SKIP THE ACC. IS SHOWN AFTER EACH SRA 1.

0000 0	C03C	LO	K8000	8000
0001 0	4820	BSC	Z	SHOULD NOT SKIP
0002 0	1801	SRA	1	4000
0003 0	4820	BSC	Z	SHOULD NOT SKIP
0004 0	1801	SRA	1	2000
0005 0	4820	BSC	Z	SHOULD NOT SKIP
0006 0	1801	SRA	1	1000
0007 0	4820	BSC	Z	SHOULD NOT SKIP
0008 0	1801	SRA	1	0800
0009 0	4820	BSC	Z	SHOULD NOT SKIP
000A 0	1801	SRA	1	0400
000B 0	4820	BSC	Z	SHOULD NOT SKIP
000C 0	1801	SRA	1	0200
000D 0	4820	BSC	Z	SHOULD NOT SKIP
000E 0	1801	SRA	1	0100
000F 0	4820	BSC	Z	SHOULD NOT SKIP
0010 0	1801	SRA	1	0080
0011 0	4820	BSC	Z	SHOULD NOT SKIP
0012 0	1801	SRA	1	0040
0013 0	4820	BSC	Z	SHOULD NOT SKIP
0014 0	1801	SRA	1	0020
0015 0	4820	BSC	Z	SHOULD NOT SKIP
0016 0	1801	SRA	1	0010
0017 0	4820	BSC	Z	SHOULD NOT SKIP
0018 0	1801	SRA	1	0008
0019 0	4820	BSC	Z	SHOULD NOT SKIP
001A 0	1801	SRA	1	0004
001B 0	4820	BSC	Z	SHOULD NOT SKIP
001C 0	1801	SRA	1	0002
001D 0	4820	BSC	Z	SHOULD NOT SKIP
001E 0	1801	SRA	1	0001
001F 0	4820	BSC	Z	SHOULD NOT SKIP
0020 0	3003	WAIT	/0003	-- 1 EQU. 0021 A EQU. 0001
				ERROR, RESET THEN SI, SEE EACH INST.
				OK PRESS START
0021 0	1801	SRA	1	0000
0022 0	4820	BSC	Z	SHOULD SKIP
0023 0	30F3	WAIT	-13	**ERR. A SHOULD BE ZERO
0024 0	3003	WAIT	/0003	--1 EQU. 0025 A EQU. 0000
				ERROR, RESET THEN SI, SEE EACH INST.
				OK PRESS START
				*OK. SHOWS 1 CNTR. OK FROM 0000 TO /0025
				* BSC Z SKIPS ONLY WHEN ACC = 0000
				* SRA 1 OK FOR ONE BIT IN ANY POSITION
				*BEGIN TEST OF TRANSFERS OF B-D-A-M-----
				* AND A-U-A AND A-R
				* THE CONTENTS OF ACC. IS SHOWN AFTER EACH CHANGE
0025 0	C018	LD	KFOFO	FOFO
0026 0	D008	STO	/FFFF	
0027 0	C0D7	LD	/FFFF	
0028 0	D0D7	STO	/0000	
0029 0	C006	LD	/0000	
002A 0	1804	SRA	4	0F0F
002B 0	D0D3	STO	/FFFF	
002C 0	C0D2	LD	/FFFF	
002D 0	0002	STO	/0000	
002E 0	C0D1	LD	/0000	

ONE-CARD DIAGNOSTIC PROGRAMS
CARO 03

002F 0 3003 WAIT /0003 --1 EQU. 0030 A EQU. 0F0F
* IF ERROR, LOAD 1 CTR. /0025, THEN SI AND
*SEE THAT REGS. AS SHOWN FOR EACH INSTRUCTION.
* QUAD CARDS GATE A2 ROWS 4,5
* IBM CARDS GATE A2 ROWS 6,7
* BIT POS. -- 0-1 2-3 4-5 6-7 8-9 10-11 12-13 14-15
* CARO C0L.-- C D E F G H J K
* IF OK , PRESS START-----
* TEST FOR
EOR KFOFO SET ACC TO FFFF
STO KFFFF STORE IT
WAIT /0003 --1 EQU. 0033 A EQU. FFFF
EOR KFFFF CLEAR ACC TO 0000
BSC Z SHOULD SKIP
WAIT -13 **ERR. ACC SHOULD BE 0000
EOR K0000 ACC SHOULD STAY 0000
BSC Z SHOULD SKIP
WAIT -13 **ERR. ACC SHOULD BE 0000
EOR KFOFO ACC SHOULD GO TO FOFO
EOR /FFFF ACC SHOULD BE FFFF
* LOC. /FFFF SHOULD BE 0F0F
003B 0 3003 WAIT /0003 --1 EQU. 003C A EQU. FFFF
* IF ERROR PUT IN SI MODE AND START
MDX /002E
* OK ,TEST ON THIS CARO COMPLETE.
* NO ERRORS ON THIS TEST SHOW ALL BITS TRANSFER
* CORRECTLY FROM CORE-B-D-A-M AND A-U-A-D-B-CORE.
* THAT EOR WORKS RIGHT. THAT BSC Z WORKS RIGHT.
* THAT ACC. WILL SHIFT A ONE BIT RIGHT FROM ANY
* POSITION. THAT LO, STO, EOR, BSC Z, SRA 1, WAIT
* INSTRUCTIONS OK. 1 CNTR. STEPS FROM /0000 TO/003C
K8000 OC /8000
KFOFO DC /FOFO
KFFFF OC /FFFF
K0000 OC /0000
BSS /D
OC /2000 HEXIOECIMAL NUMBER 0
OC /0040 HEXIOECIMAL NUMBER 3
END 0

0030 0	F000
0031 0	0000
0032 0	3003
0033 0	F008
0034 0	4820
0035 0	30F3
0036 0	F009
0037 0	4820
0038 0	30F3
0039 0	F004
003A 0	F0C4
003D 0	8000
003E 0	F0F0
003F 0	FFFF
0040 0	0000
0041 0	0000
004F 0	2000
004F 0	0040
0050	0000

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 03

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
KFFFF	003F	0031,0033
KFOFO	003E	0025,0030,0039
K0000	0040	0036
K8000	0030	0000

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 04

ABS		002770
* TEST LONG FORMAT OF LO A STO LOX EOR.		002728
* THEN-		002779
* TEST ADD OF POSITIVE AND NEGATIVE ONES.		002730
* A COMPREHENSIVE TEST OF ADD IS PERFORMED ON		002740
* EACH PASS. A PASS TAKES ABOUT 4 SECONDS.		002750
* VERIFY CORRECT LOOPING BY SINGLE INSTRUCTION.		002760
* PROGRAM FORMS CONTINUOUS LOOP.		002770
* TO EXIT- PRESS RESET + PROGRAM LOAD.		002780
028C	ORG /0000	002790
0000 0 C013	LD K4000	002791
0001 0 1804	SRA 4	002792
0002 0 0012	STO K0400	002793
0003 0 F012	EOR LD	002794
0004 0 0011	STO LD	002795
0005 0 C00F	LD K0400	002796
0006 0 F012	EOR EOR	002797
0007 0 0011	STO FOR	002798
0008 0 C00C	LD K0400	002799
0009 0 F011	FOR STO	002800
000A 0 0010	STO STO	002801
000B 0 C009	LD K0400	002802
000C 0 F011	FOR A	002803
000D 0 0010	STO A	002804
000E 0 C006	LD K0400	002805
000F 0 F001	EOR LDX	002806
0010 0 0000	STO LOX	002807
0011 00 64000016	LDX LDX L LD	002808
0013 0 30F4	WAIT -12	002809
0014 0 4000	K4000 DC /4000	002810
0015 0 0400	K0400 DC /0400	002812
0016 00 C4000031	LD LD L KFOFO	002813
0018 0 1804	SRA 4	002814
0019 00 F4000031	EOR EOR L KFOFO	002815
001B 00 D400002F	STO STO L KFFFF	002816
0010 0 3004	WAIT /0004	002840
001F 00 94000030	A A L K0001	002841
0020 0 0000	STO SUMPL	002860
0021 0 000B	STO SUMMI	002870
0022 0 3004	WAIT /C004	002880
0023 0 C009	BEGIN LD SUMMI	002890
0024 0 800A	A KFFFF	002900
0025 0 0007	STO SUMMI	002910
0026 0 C007	LD SUMPL	002920
0027 0 800B	A K0001	002930
0028 0 0005	STO SUMPL	002940
0029 0 8003	A SUMMI	002950
002A 0 4820	BSC Z	002960
002B 0 30F4	WAIT -12	002970
002C 0 70F6	MOX BEGIN	002980
0020 0 0000	SUMMI DC /0000	002990
002E 0 0000	SUMPL DC /0000	003000
002F 0 0000	KFFFF DC /0000	003010
0030 0 0001	K0001 DC /0001	003020
0031 0 F0F0	KFOFO DC /F0F0	003030
0032 001C	BSS /1C	003040
004E 0 2000	DC /2000	003050
004F 0 0020	DC /0020	003060
0050 0000	ENO 0	003070
MAKE LONG FORM INSTRUCTIONS		
BRANCH TO TEST LONG FORM.		
**ERR. LOX FAILED		
BEGIN LONG FORM TEST		
-- SEE ACC. EQU. FFFF		
CLEAR SUM PLUS LOCATION		
CLEAR SUM MINUS LOCATION		
--SEE ACC. EQU. 0000		
LOAD SUM OF MINUS ONES		
ADD MINUS ONE TO IT		
STORE SUM OF MINUS ONES		
LOAD SUM OF PLUS ONES		
ADD PLUS ONE TO IT		
STORE SUM OF PLUS ONES		
ADD SUMMI TO SUMPL		
SHOULD ALWAYS SKIP		
**ERR. ACC NOT ZERO		
HEXIDECIMAL NUMBER 0		
HEXIDECIMAL NUMBER 4		

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 04

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
A	001F	000C,0000
BEGIN	0023	002C
END	0019	0006,0007
FFFF	007F	0018,0024
K0000	0031	0016,0019
K0001	0030	001F,0027
K0400	0015	0007,0025,0008,0009,000F
K4000	0014	0000
LD	0016	0003,0004,0011
LDX	0011	000F,0010
STO	0019	0009,000A
SUMMI	002D	0021,0023,0025,0029
SUMPL	002F	0020,0026,0028

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 05

028C	ABS	003107
	ORG 0	003110
	* TEST THAT LOCS. 0050 THRU FFF CAN BE ADDRESSED	003120
	* PROGRAM SHOULD STOP AT LOC. 00FF WITH R 300A	003130
	* PRESS RESET AND START. PROGRAM THEN SHOULD STOP	003140
	* AT LOC. 004A WITH R 300A AND ACC. 00AF WHICH	003150
	* IS THE NUMBER OF LOCATIONS TESTED. PROGRAM	003160
	* CAN BE RE-RUN BY PRESSING START.	003170
	MOD1 LD K1000 PROGRAM REPLACES THIS	003180
0000 0 C022	SRA 2	003190
0001 0 1802	EOR STLN	003200
0002 0 F02F	STO STWT MAKE UP LONG INSTRUCTIONS	003210
0003 0 000C	STQ STLN	003220
0004 0 002C	LD K1000	003230
0005 0 C01D	SRA 2	003240
0006 0 1802	EOR CHCK	003250
0007 0 F035	STO CHCK	003260
0008 0 0034	LO K0000	003270
0009 0 C01A	SRA 4	003280
000A 0 1804	EOR STWT+1	003290
000B 0 F005	STO STWT+1	003300
000C 0 0004	LD CON1	003310
000D 0 C01B	STO MOD1 MODIFY LOCATION 0000	003320
000E 0 00F1	LD KWAIT	003330
000F 0 C03B	STWT STO L /00FF PUT WAIT INTO /00FF	003340
0010 00 040000FF	LD SUMC	003350
0012 0 C015	MOD3 A MOD3+1 FORM CHECK SUM	003360
0013 0 8000	STO SUMC	003370
0014 0 0013	LO MOD3	003380
0015 0 C0FD	A K0001	003390
0016 0 800A	STO MOD3	003400
0017 0 00FB	EOR CON3	003410
0018 0 F00F	BSC Z	003420
0019 0 4820	MOX MOD3-1	003430
001A 0 70F7	LO SUMC	003440
001B 0 C00C	BSC Z SHOULD SKIP	003450
001C 0 4820	WAIT -11 **ERR. SUM SHOULD BE 0000	003460
001D 0 30F5	MOX RSTR	003470
001E 0 700B	DC /000C USED TO MAKE CHECK SUM	003480
001F 0 000C	DC /000C USED TO MAKE CHECK SUM	003490
0020 0 000C	K0001 DC /0001	003500
0021 0 0001	K0001 DC /5000	003510
0022 0 5000	K1000 OC /1000	003520
0023 0 1000	K0000 OC /F000	003530
0024 0 F000	K0001 BSI X -1	003540
0025 0 40FF	CON1 MODX X CHECK-MOD1-1	003550
0026 0 703A	CON3 A X BEGIN-MOD3	003560
0027 0 803C	SUMC OC /00FC	003570
0028 0 00FC	SUML DC /2030	003580
0029 0 2030	RSTR LD KBGIN LOAD ACC. TO 5000	003590
002A 0 C0F7	SRA 8 SHIFT TO /0050	003600
002B 0 1808	STO STLN+1 RESTORE	003610
002C 0 0005	STO CHCK+1 RESTORE	003620
002D 0 0010	SRA 16 ACC = /0000	003630
002E 0 1810	STO SUMI RESTORE	003640
002F 0 00F9	LD K0001 PUT BSI-1 INTO CORE	003650
0030 0 C0F4	STLN STO L /0050	003660
0031 00 04000050	LD STLN+1	003670
0033 0 C0FF	A K0001 MODIFY STORE ADDRESS	003680
0034 0 80EC	STO STLN+1	003690
0035 0 00FC	EOR STWT+1	003700
0036 0 F00A	BSC Z SKIP WHEN LOC. 00FF STORED	003710
0037 0 4820	MOX STLN-1	003720
0038 0 70F7	MOX /0050 RUN SERIES OF BSI-1 STORED	003730
0039 0 7016	WAIT -11 **ERR. ADDRESS PLUS ONE	003740
003A 0 30F5	* DOES NOT EQUAL ADDRESS OF LOCATION TESTED.	003750
	CHECK LO CHCK+1 LOAD THE ADDRESS BEING	003760
003B 0 C002	A K0001 TESTED AND ADD ONE.	
003C 0 80E4		

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 05

003D 00 F4000050	CHK	FOR	L	/0050	COMPARE WITH CONTENTS.	003770
003F 0 4820	BSC	Z			SHOULD BE ZERO AND SKIP	003780
0040 0 70F9	MDX	CHECK-1			ERROR, STOP + SING. INST.	003790
0041 0 C0F7	LD	SUML				003800
0042 0 80DE	A	K0001			FORM SUM OF = LDOS. TESTED	003810
0043 0 D0F5	STO	SUML				003820
0044 0 C0F9	LD	CHK+1			MODIFY TO TEST NEXT LOC.	003830
0045 0 80DB	A	K0001				003840
0046 0 D0F7	STO	CHK+1				003850
0047 0 F0C9	FOR	STWT+1			CHECK IF ALL TESTED	003860
0048 0 4820	BSC	Z			SKIP, ALL LDOS. TESTED	003870
0049 0 70F1	MDX	CHECK-2			GO CHECK NEXT LOCATION	003880
004A 0 C0DE	LD	SUML			LOAD SUM OF NUMBER TESTED.	003890
004B 0 3005	KWAIT	WAIT		/0005	--ACC. EQU. OFAF IS NUMBER	003900
004C 0 70DD	MDX	RSTR			TESTED.	003910
004D 0 D8FF	DC	/D8FF			USED TO MAKE CHECK SUM	003920
004E 0 2000	DC	/2000			HEXIDECIMAL NUMBER 0	003940
004F 0 0010	BGIN	DC		/0010	HEXIDECIMAL NUMBER 5	003950
0050 0000	FND	0				003960

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 05

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
BGIN	004F	0027
CHK	003D	0007,0008,002D,003B,0044,0046,0049
CHECK	003B	0026,0040
CON1	0026	000D
CON3	0027	0018
KBGIN	0022	002A
KBSI	0025	0030
KFOOD	0024	0009
KWAIT	004B	000F
K0001	0021	0016,0034,003C,0042,0045
K1000	0023	0000,0005
M001	0000	000E,0026
MOD3	0013	0013,0015,0017,001A,0027
RSTR	002A	001E,004C
STLN	0031	0007,0004,002C,0033,0035,0038
STWT	0010	0003,000B,000C,0036,0047
SUMC	0028	0012,0014,001B
SUML	0029	002F,0041,0043,004A

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 06

```

028C      ABS      0
          ORG      0
          * TEST OF LOADER CARD 1 FUNCTIONS
          * USING BIT SWITCHES FOR OSW + FOR COLUMN DATA
          * THIS PROG. IS IDENTICAL TO CARD 1 FROM 10 TO 40
          * EXCEPT FOR XIO COMMANDS.
0000 0 0024      START LD      ROIN+1      SFT UP I/O CONT. COMMANDS
0001 0 1004      SRA      4
0002 0 0024      FOR      ROSW+1
0003 0 0021      STO      RDIN+1
0004 0 0022      STO      ROSW+1
0005 0 0023      LD      SENSE+1      MAKE UP STORE LONG
0006 0 1001      SRA      1
0007 0 0034      EOR      STORE
0008 0 0033      STO      STORE
0009 0 0014      LO      CHKSM      MAKE UP ADDR. FOR STO LONG
000A 0 1008      SRA      8
000B 0 0031      EOR      STORE+1
000C 0 0030      STO      STORE+1
000D 0 701F      MDX      SRTRD
000E 0 0000      OC      0
000F 0 0000      OC      0
0010 0 0000      OC      0
0011 0 0000      DC      0
0012 0 0000      OC      0
0013 0 0000      OC      0
0014 0 0000      OC      0
0015 0 0000      OC      0
0016 0 0000      OC      0
0017 0 0000      DC      0
0018 0 0000      DC      0
0019 0 0000      OC      0
001A 0 0000      OC      0
001B 0 0000      OC      0
001C 0 0000      OC      0
001D 0 700F      ENOCK MDX      SRTRO
001E 0 0000      CHKSM OC      /B000
001F 0 0000      K0000 OC      /0800
0020 0 0003      K8003 OC      /8003
0021 0 0000      K8000 OC      /8000
0022 0 0001      K0001 OC      /0001
0023 0 0000      DC      /0000
0024 0 0000      RDIN DC      /0000      RD SWS. INTO LOCS. 0 OR 1
0025 0 0000      DC      /A000      /3A00 SET BY PROGRAM
0026 0 0028      ROSW DC      SENSE      RD SWS. INTO LOC. SENSE
0027 0 0000      DC      /3000      /3A00 SET BY PROGRAM
0028 0 0004      SENSE DC      /0004      SENSE DSW CONTROL COMMAND
0029 0 2808      OC      /2808
002A 0 0000      COUNT DC      /0000
002B 0 00F3      ERROR EOR      K0800      RESTORE ACC. TO OSW
002C 0 30F6      WAIT      -10      **ERR. STOP DSW NOT RIGHT
002D 0 3006      SRTRD WAIT      /6      TO LOOP, REPLACE WAIT
002E 0 00F7      XIO      RDSW      READ SWITCHES INTO SENSE
002F 0 00F8      LD      SENSE      LOAD BIT SWS. INTO ACC.
0030 0 00F8      FOR      K8003      CHECK BITS 0,14+15 ONLY
0031 0 4020      BSC      Z      SKIP IF BITS 0,14+15 ONLY
0032 0 700F      MDX      CONT1      CONTINUE OSW ANALYSIS
0033 0 00F0      XIO      ROIN      READ BIT SWITCHES INTO 0,1
0034 0 00EF      LD      RDIN
0035 0 00FC      EOR      K0001      SWITCH READ IN AREA, EVEN
0036 0 00ED      STO      RDIN      TIMES IN 0 00D IN 1
0037 0 4020      BSC      Z      SKIP 2 WORDS READ
0038 0 70F4      MOX      SRTRD
0039 0 00C6      LD      START      GET FIRST WORD
003A 0 1008      SRA      8      SHIFT IT
003B 0 00C5      EOR      START+1      EOR WITH SECOND WORD
003C 0 0004      STORE DC      /C004      STORE LONG AT 40
003D 0 00F5      DC      /00F5      SET UP BY PROG.

```

003990
004000
004010
004020
004030
004040
004050
004060
004070
004080
004090
004100
004110
004120
004130
004140
004150
004160
004170
004180
004190
004200
004210
004220
004230
004240
004250
004260
004270
004280
004290
004300
004310
004320
004330
004340
004350
004360
004370
004380
004390
004400
004410
004420
004430
004440
004450
004460
004470
004480
004490
004500
004510
004520
004530
004540
004550
004560
004570
004580
004590
004600
004610
004620
004630
004640
004650
004660

ONE-CARD DIAGNOSTIC PROGRAMS
CARD D6

003F	0	COFF	LD	STORE+1		004670
003F	0	80F3	A	K0001+1	DUMMY MODIFY OF STO L	004680
0040	0	D0FC	STO	STORE+1		004690
0041	0	70EA	MDX	SRTRD		004700
0042	0	F0DF	CONT1 EOR	K8000	CHECK FOR BITS 14+15 ONLY	004710
0043	0	4820	BSC	Z	SKIP BUSY AND NOT READY	004720
0044	0	7001	MDX	CONT2		004730
0045	0	70E7	MDX	SRTRD		004740
0046	0	C0F1	CONT2 LD	SENSE	BIT SWS. LOADED TO ACC.	004750
0047	0	F0D7	EOR	K0800	CHECK FOR BIT 4 ONLY	004760
0048	0	4820	BSC	Z	SKIP END OF CARO	004770
0049	0	70E1	MOX	ERRDR		004780
004A	0	C0DF	LD	COUNT	COUNT PASSES	004790
004B	0	8006	A	K0001		004800
004C	0	70E0	MDX	SRTRD		004810
004D	0	9000	DC	0		004820
004E	0	2000	OC	/2000	HEXIDECIMAL NUMBER 0	004830
004F	0	0008	DC	/0008	HEXIDECIMAL NUMBER 8	004840
0050		0000	END	0		004850

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 06

CROSS REFERENCE LISTING

SYMBOL	VALUE	REFERENCES
CHKSM	001E	0009
CONT1	0042	0032
CONT2	0046	0044
COUNT	002A	004A
ENDCK	001D	
ERROR	002B	0049
K0001	0022	0035,003F,004B
K0000	001F	002B,0047
K8000	0021	0042
K8003	0020	0030
RDIN	0024	0000,0003,0033,0034,0036
RDSW	0026	0002,0004,002E
SENSE	0028	0005,0026,002F,0046
SRTRO	002D	0000,001D,0038,0041,0045,004C
START	0000	0039,0038
STORE	003C	0007,0008,000B,000C,003E,0040

ONE-CARD DIAGNOSTIC PROGRAMS
CARD 07

028C	ABS	004880
	ORG 0	004890
	* TEST DOUBLE PRECISION LOAD AND ADD AND	004891
	* PROGRAM FOR SCOPE LOOPS ON READ CARD	004900
	* XIO FUNCTIONS ARE IDENTICAL TO CARD1 BUT NO STOP	004910
	* ON ERROR.	004920
0000 0 C017	LD KFOFO SET UP CONSTANT /OFOF	004921
0001 0 1804	SRA 4	004922
0002 0 0016	STO KFOFO+1	004923
0003 0 0016	STO KFOFO+2	004924
0004 0 C813	LDD KFOFO TEST LOAD DOUBLE	004925
0005 0 8414	AD KFOFO+2 TEST ADD DOUBLE	004926
0006 0 3007	WAIT /C007 --SEE ACC. FFFF Q FFFF IF OK	004927
		004928
0007 0 C01D	START LO ROIN+1 CORRECT I/O CONT. COMM.	004930
0008 0 1802	SRA 2 SHIFT IT	004940
0009 0 0018	STO ROIN+1 STORE IT	004950
000A 0 C018	LD K0001+1 CORRECT I/O CONT. COMM.	004960
000P 0 1801	SRA 1 SHIFT IT	004970
000C 0 0016	STO K0001+1 STORE IT	004980
000D 0 C01B	LD SENSE+1 CORRECT I/O CONT. COMM.	004990
000E 0 1803	SRA 3 SHIFT IT	005000
000F 0 0019	STO SENSE+1 STORE IT	005010
0010 0 F016	FOR RESET+1	005020
0011 0 0015	STO RESET+1	005030
0012 0 700A	MDX ENOCK	005040
0013 0 0000	CC 0	005060
0014 0 0000	OC 0	005070
0015 0 0000	OC 0	005080
0016 0 0000	OC 0	005090
0017 0 0000	OC 0	005100
0018 0 F0F0	KFOFO DC /F0F0	005110
0019 0 0F0F	OC /OFOF	005120
001A 0 0F0F	OC /OFOF PUT IN BY PROGRAM	005200
001B 0 F0F0	OC /F0F0	005210
001C 0 0000	OC 0	005215
001D 0 700F	ENOCK MDX SRTRO	005220
001F 0 0800	K0800 DC /0800	005230
001E 0 8003	K8003 DC /8003	005240
0020 0 8000	K8000 OC /8000	005250
0021 0 0000	DC 0	005260
0022 0 0001	K0001 DC /0001 START RO, USED AS CONSTANT	005270
0023 0 2808	OC /2808 /1404 SET BY PROG.	005280
0024 0 0000	ROIN OC /0000 READ IN LOCATIONS 0 AND 1	005290
0025 0 4800	OC /4800 /1200 SET BY PROG.	005300
0026 0 0000	RESET OC 0 RESET DSW CONTROL COMMAND	005310
0027 0 0003	OC /0003 /1703 SET BY PROG.	005320
0028 0 0004	SENSE OC /0004 SENSE DSW CONTROL COMMAND	005330
0029 0 8800	OC /8800 /1700 SET BY PROG.	005340
002A 0 0000	OC 0	005350
002B 0 F0F2	ERROR FOR K0800 RESTORE ACC. TO OSW	005360
002C 0 7000	MDX * PUT WAIT HERE FOR ERR. STOP	005370
002D 0 08F4	SRTRO XIO K0001 START READ	005380
002E 0 08F7	XIO RESET RESET OSW	005390
002F 0 08F8	XIO SENSE SENSE OSW FOR CRP	005400
0030 0 F0EE	EDR K8003 CHECK BITS 0,14+15 ONLY	005410
0031 0 4820	BSC Z SKIP IF BITS 0,14+15 ONLY	005420
0032 0 700F	MDX CONT1 RD COL.	005430
0033 0 08F0	XIO ROIN	005440
0034 0 C0EF	LO ROIN	005450
0035 0 F0EC	FOR K0001	005460
0036 0 00E0	STO ROIN	005470
0037 0 4820	BSC Z SKIP, 000 COL. JUST READ	005480
0038 0 7002	MDX HOP	005490
0039 0 C0C7	LO /0001 LOAD 000 COL. JUST READ	005500
003A 0 7006	MOX JUMP	005510
003B 0 C0C4	HDP LO /0000 LOAD EVEN COL. JUST READ	005520
003C 0 7004	MOX JUMP	005530

TABLE OF CONTENTS

PARAGRAPH	PAGE
1. PURPOSE.	1
2. PREREQUISITES.	1
2.1 PROGRAM PREREQUISITES	
2.2 EQUIPMENT PREREQUISITES	
3. USE PROCEDURE.	1A
3.1 NORMAL LOADING PROCEDURE	
3.2 DIAGNOSTIC LOADING PROCEDURE	
3.3 DIAGNOSTIC GUIDE	
3.4 PROGRAM HALTS	
4. PRINTOUTS (NONE)	
5. COMMENTS	2
5.1 BASIC-LOADER FIRST-CARD FUNCTIONS	
5.2 FUNCTIONS OF BASIC-LOADER CARDS (TWO THRU FIVE)	
6. APPENDIX	3
6.1 PUNCHED-CARD 8-B FORMAT	

1. PURPOSE
- TO LOAD PROGRAM DECKS PUNCHED IN THE FORMAT SUCH AS THE CPU AND CORE TESTS. THE LOADER IS CONSTRUCTED TO USE A MINIMAL INSTRUCTION SET, AND PROVIDE SOME DIAGNOSTIC ABILITY.
2. PREREQUISITES
- 2.1 PROGRAM PREREQUISITES
- THE BASIC LOADER WILL ONLY LOAD PROGRAM DECKS WHICH ARE PUNCHED IN THE B-B FORMAT DESCRIBED IN SECTION 6.1.
- 2.2 EQUIPMENT PREREQUISITES
- A. 1131 CENTRAL PROCESSING UNIT (CPU).
B. 2501 CARD READER WITH IPL.

3. USE PROCEDURE

3.1 NORMAL LOADING PROCEDURE

- A. AT 25D1 CARD READER,
1. DEPRESS NPRO PUSHBUTTON TO CLEAR FEED.
2. PLACE BASIC LOADER DECK, FOLLOWED BY MAIN PROGRAM AND TWO BLANK CARDS IN HOPPER.
3. DEPRESS START PUSHBUTTON. READY INDICATOR SHOULD LIGHT.
- B. AT 1131 CPU,
1. PUSH RESET.
2. PUSH PROGRAM LOAD. MAIN PROGRAM SHOULD LOAD AND BEGIN EXECUTION.
3. IF PROGRAM FAILS TO LOAD OR HALTS AT A WAIT INSTRUCTION BELOW LOCATION D12C, REFER TO SECTION 3.2

3.2 DIAGNOSTIC LOADING PROCEDURE

1. SET INTERRUPT DELAY SWITCH (ON CE PANEL) TO ON POSITION.
2. RETRY LOADING PROCEDURE.
- IF PROGRAM LOADS, RUN CPU AND INTERRUPT TESTS TO DIAGNOSE NOKMAL LOADER FAILURE.
- IF PROGRAM DOES NOT LOAD, REFER TO SECTION 3.3

3.3 DIAGNOSTIC GUIDE

NOTE

ALL REGISTER-CONTENT INDICATIONS IN FOLLOWING STEPS ARE EXPRESSED IN HEXADECIMAL NOTATION.

FAILURE DESCRIPTION	SUGGESTED ACTION + POSSIBLE CAUSE OF FAILURE
1. NO CARD FEEDS	POSSIBLE FAILURE OF EITHER PROGRAM-LOAD MODE OR READER.
2. FIRST CARD FEEDS BUT IS NOT READ CORRECTLY.	POSSIBLE FAILURE OF READER.
3. FIRST CARD IS READ CORRECTLY BUT NOT ABLE TO LOAD REMAINDER OF LOADER.	POSSIBLE FAILURE OF CPU INSTRUCTIONS USED TO BOOTSTRAP LOADER.
4. MAIN PROGRAM STARTS EXECUTING BEFORE ALL CARDS HAVE BEEN LOADED.	CHECK THAT LAST CARD OF PROGRAM, WHICH IS PUNCHED WITH FF IN COLUMNS 79 AND 80, IS NOT OUT OF SEQUENCE. IF CARD IS IN SEQUENCE, A READING PROBLEM IS INDICATED.
5. ALL CARDS FEED BUT MAIN PROGRAM DID NOT EXECUTE.	SEE IF LAST CARD WENT PAST THE READ STATION OF THE 1442. IF IT DID, RUN ONE-CARD DIAGNOSTIC PROGRAMS. CHECK THAT MAIN PROGRAM IS FOLLOWED BY TWO BLANK CARDS.

3.4*** PROGRAM HALTS

HALT NO. (B REG).	DESCRIPTION	RESTART ACTION
30F1	CHECK SUM ERROR ON FIRST CARD OF LOADER. EITHER THE CARD READ IN WRONG, OR THE VARIOUS WORDS WHICH ARE STORED BY THE FIRST CARD WERE NOT PROPERLY GENERATED.	RELOAD
30F5	READER CHECK WHEN LOADING TEST PROGRAM	NPRO THEN PLACE CARDS RUN OUT IN FRONT OF REMAINING DECK AND PRESS START.
30F7	CHECK SUM WHEN LOADING PROGRAM. CARD COLUMN 1-7B DID NOT HAVE ZERO CHECK SUM.	RELOAD OR PRESS START TO RETRY THE SAME CARO.
30F8	READER NOT READY BEFORE LOADING WAS COMPLETED.	MAKE READER READY, AND CHECK IF LAST CARD IS PROPER.
30FC	MOVE ERROR. MOVED DATA DID NOT COMPARE TO INPUT DATA.	NPRO THEN PLACE CARDS RUN OUT IN FRONT OF RE-MAINING DECK AND PRESS START.

4. PRINTOUTS (NONE)
5. COMMENTS

COMMENTS THE 2501 BASIC LOADER IS DESIGNED TO SUCCESSFULLY LOAD THE 8-8 FOR-
MAT TESTS SUCH AS CPU AND CORE TESTS. THE LOADER USES A MINIMUM
AMOUNT OF CIRCUITS. IT WILL RUN WITH OR WITHOUT INTERRUPT, USES
NO INDEX REGISTERS, AND WILL LOOP ON EASILY SCOPED LOOPS FOR SOME
ERRORS. THE CARD IMAGE IS PRESERVED IN CORE UNTIL IT HAS BEEN
CHECK SUMMED, AND MOVED TO ITS PROPER LOCATIONS. THE CARD MAY BE
DISPLAYED AND COMPARED MANUALLY TO VERIFY PROPER READING. EACH
OPERATION, IE. CARO READ, CHECKSUM, MOVE AND CHECK ARE SELF CON-
TAINED AND DO NOT OVERLAP, ALLOWING A FAILING OPERATION TO BE RE-
PEATED.

5.1 BASIC-LOADER FIRST-CARD FUNCTIONS

- 5.1.1 AFTER BEING LOADED IN IPL MODE, THE FIRST-CARD PROGRAM DEVELOPS A
CHECKSUM TO DETERMINE IF IT WAS LOADED CORRECTLY. IF THE CHECKSUM IS
NOT 0000, THE PROGRAM STOPS AT A WAIT WITH THE DEVELOPED CHECKSUM
DISPLAYED BY THE ACCUMULATOR.
- 5.1.2 IF THE CHECKSUM IS CORRECT, THE FIRST-CARD PROGRAM PROCEEDS TO LOAD
CARDS TWO THROUGH FIVE. TWO CARD COLUMNS WILL FORM ONE STORAGE WORD
BECAUSE THESE CARDS ARE PUNCHED IN 8-8 MODE. THE DSW IS CHECKED, AND
IF AN ERROR IS DETECTED, THE PROGRAM WILL STOP AT A WAIT WITH THE
ERROR DSW DISPLAYED BY THE ACCUMULATOR. THE CONDITION CAUSING THE
DSW ERROR MUST BE CORRECTED BEFORE ATTEMPTING TO RELOAD.

- 5.1.3 AFTER LOADING CARDS TWO THROUGH FIVE, THE PROGRAM BRANCHES TO
BEGINNING OF PROGRAM JUST LOADED.

5.2 FUNCTIONS OF BASIC-LOADER CARDS TWO THROUGH FIVE

- 5.2.1 CARDS TWO THROUGH FIVE LOAD A MAIN-PROGRAM CARD INTO LOCATIONS 0010
TO 0036. THE DSW IS CHECKED AFTER READING A CARD, AND IF AN
ERROR OCCURRED, THE PROGRAM STOPS AT A WAIT WITH THE DSW ERROR
DISPLAYED BY THE ACCUMULATOR.
- 5.2.2 CARDS TWO THROUGH FIVE ALSO DEVELOP CHECKSUM OF LOCATIONS 0010
THROUGH 0036. IF CHECKSUM IS OTHER THAN 0000, PROGRAM STOPS AT ERROR
WAIT WITH CHECKSUM DISPLAYED BY ACCUMULATOR. A CORRECT CHECKSUM
MEANS CARD WAS READ CORRECTLY.
- 5.2.3 THE WORD COUNT, (NUMBER OF WORDS ON THE CARD) IS TAKEN FROM
LOCATION 0034. IF IT IS ZERO PROGRAM STOPS AT ERROR-WAIT.
- 5.2.4 THE NUMBER OF WORDS SPECIFIED IN LOCATION 0034 IS RELOCATED,
STARTING AT THE ADDRESS THAT WAS SPECIFIED IN CARD COLUMNS 75 AND 76
AND THAT WAS READ INTO LOCATION 0035.
- 5.2.5 THE DATA READ AND THE DATA AT THE TRANSFERED LOCATION ARE COMPARED
WORD BY WORD TO VERIFY THAT THE RELOCATION HAS BEEN DONE CORRECTLY.
AN UNEQUAL COMPARISON RESULTS IN THE PROGRAM STOPPING AT AN ENOV-WAIT
INDICATING AN RELOCATION ERROR.
- 5.2.6 THE PROGRAM REPEATS THE STEPS DISCUSSED IN PARAGRAPHS 5.2.1 THROUGH
5.2.5 FOR EACH CARD OF THE MAIN PROGRAM DECK, EXCEPT FOR THE LAST
CARD, WHICH MUST HAVE A LOCATION ADDRESS OF 0000. AFTER READING THE
CARD AND DEVELOPING THE CHECKSUM, THE PROGRAM BRANCHES TO LOCATION
0010 AND STARTS EXECUTING THE MAIN LINE PROGRAM.

6. APPENDIX

6.1 PUNCHED CARD 8-8 FORMAT

THE ORGANIZATION OF THE PUNCHED CARD 8-8 FORMAT IS AS FOLLOWS.

- A. COLUMNS 1 THROUGH 72 CONTAIN HALF WORDS (8 BITS) PUNCHED INTO ROWS 12 THROUGH 5. WORD-BITS 0 THROUGH 7 ARE PUNCHED INTO EVEN NUMBERED COLUMNS. WORD-BITS 8 THROUGH 15 ARE PUNCHED INTO ODD NUMBERED COLUMNS.
- B. COLUMNS 73 AND 74 CONTAIN A WORD-COUNT OF THE TOTAL NUMBER OF DATA WORDS PUNCHED INTO THE CARD.
- C. COLUMNS 75 AND 76 CONTAIN THE LOCATION, IN CORE WHERE THE DATA ON THE CARD ARE TO BE LOADED.
- D. COLUMNS 77 AND 78 CONTAIN A CHECKSUM (TWO'S COMPLEMENT OF THE SUM OF ALL WORDS IN COLUMNS 1 THROUGH 76).
- E. COLUMNS 79 AND 80 CONTAIN THE CARD'S SEQUENCE NUMBER PUNCHED IN HOLLERITH/HEXADECIMAL FORMAT.

----- LAST PAGE -----

```
0000      A8S
          ORG  0
          *-----
          *      800TSTRAP CARD #1
          *-----
          *      LOADED BY IPL.  THESE INSTRUCTIONS
          *      BUILD LONG FORM INSTRUCTIONS
          *      NECESSARY TO LOAD THE REST OF
          *      THE LOADER.
          *-----
0000 0 C037  START LD   PACK&1  8800
0001 0 1801      SRA   1        4400
0002 0 F034      EOR   PACK     C400
0003 0 D033      STO   PACK     C400  LD  L
0004 0 F037      EOR   STO     D400
0005 0 D036      STO   STO     D400  STO  L
0006 0 F033      EOR   EOR     F400
0007 0 0032      STO   EOR     F400  EOR  L
0008 0 1804      SRA   4        0F40
0009 0 F021      EOR   K4001    4F41
000A 0 D022      STO   RESET    4F41  RESET IOCC
000B 0 7001      MDX   *&1      4F41
000C 0 0031      OC    INT
000D 0 1808      SRA   8        004F
000E 0 D018      STO   STRD     004F  START DR ADDR
000F 0 8020      A     ONE      0050
0010 0 002A      STO   EOR&1    0050  1ST HALF WD ADDR
0011 0 D028      STO   STO&1    0050  1ST STORE ADDR
0012 0 801D      A     ONE      0051
0013 0 0024      STO   PACK&1   0051  2ND HALF WD ADDR
0014 0 8017      A     LAST     0078
0015 0 D016      STO   LAST     0078  END STORE ADDR
0016 0 C014      LD    K4001    4001
0017 0 1806      SRA   6        010D
0018 0 F014      EOR   RESET    4E01
0019 0 D011      STO   STRD&1   4E01  START RD I/CC
001A 0 1808      SRA   8        004E
001B 0 D033      STO   WC       004E  WORD COUNT
          *
001C 0 C011  STRT  LD    CHKSM   FORM CHECK SUM, THIS CARD
001D 0 8006      A     *&6      FROM 0024 THRU 004F
001E 0 D00F      STO   CHKSM
001F 0 C0FD      LD    STRT&1
0020 0 800F      A     ONE      MODIFY ADD INST
0021 0 D0F8      STO   STRT&1
0022 0 F00C      EOR   CON1     CHECK THAT LAST LOC CHKD
0023 0 4820      BSC   Z        SKIP IF FINISHED
0024 0 601C      LDX   STRT     GO GET NEXT WORD
0025 0 C008      LD    CHKSM    GET SUM OF 0024 THRU 004F
0026 0 4820      BSC   Z        SKIP IF CHKSM ZERO
0027 0 30F1      WAIT  -15      CHECK SUM ERROR
0028 0 6033      ENOCC LDX  SRTRD  START LOADING
          *
          *
0029 0 0800      K0800 DC    /0800
002A 0 0000      STRD  DC      0
002B 0 4001      K4001 DC    /4001
002C 0 0026      LAST  DC    /0026
002D 0 0000      RESET OC    *-*
002E 0 001B      CHKSM DC    /001B
002F 0 8031      CON1  A      X  80-STRT-3
0030 0 0001      ONE   DC    /0001
          *
          *-----
          *      THESE INSTRUCTIONS LOAD THE REST
          *      OF THE LOADER.
          *-----
0031 0 0000      INT   DC      0
```

3AD00020
3AD00030
3AD00040
3AD00050
3AD00060
3AD00070
3AD00080
3AD00090
3AD00100
3AD00110
3AD00120
3AD00130
3AD00140
3AD00150
3AD00160
3AD00170
3AD00180
3AD00190
3AD00200
3AD00210
3AD00220
3AD00230
3AD00240
3AD00250
3AD00260
3AD00270
3AD00280
3AD00290
3AD00300
3AD00310
3AD00320
3AD00330
3AD00340
3AD00350
3AD00360
3AD00370
3AD00380
3AD00390
3AD00400
3AD00410
3AD00420
3AD00430
3AD00440
3AD00450
3AD00460
3AD00470
3AD00480
3AD00490
3AD00500
3AD00510
3AD00520
3AD00530
3AD00540
3AD00550
3AD00560
3AD00570
3AD00580
3AD00590
3AD00600
3AD00610
3AD00620
3AD00630
3AD00640
3AD00650
3AD00660
3AD00670
3AD00680
3AD00690

```
0032 0 6037
0033 0 08F6
0034 0 08F7
0035 0 4804
0036 0 6034
0037 0 8000
0038 0 8800
0039 0 1808
003A 0 2000
003B 0 0000
003C 0 1000
003D 0 0000
003E 0 C0F9
003F 0 80F0
0040 0 D0FA
0041 0 80EE
0042 0 D0F5
0043 0 C0F9
0044 0 80EB
0045 0 00F7
0046 0 F0E5
0047 0 4820
0048 0 6037
0049 0 7006
004A
004F 0 004E
0050 0000
0050 0 C0FE
0051 0 D400 0090
0053 0 C0D6
0054 0 80FA
0055 0 D004
0056 0 C0FB
0057 0 80F7
0058 0 D0F9
0059 0 C0F5
005A 0 1801
005B 0 80D0
005C 0 D0CF
005D 0 C006
005E 0 80D1
005F 0 D004
0060 0 F004
0061 0 4820
0062 0 70D0
0063 0 6078
0064 0 0000
0065 0 0004
0010
0058
0059
005A
005B
0066 0 000F
0067 0 4E00
```

```
LDX  PACK
*
SRTRD XIO  STRD
      XIO  RESET-1
      8SC  E
      LDX  SRTRD&1
*
PACK  DC    /8000  LD  L  RDIN&1
      DC    /8800
      SRA   8
EOR   DC    /2000  EOR  L  RDIN
      DC    0
STO   DC    /1000  STO  L  RDIN
      DC    0
      LD    PACK&1
      A     ONE
      STO   EOR&1
      A     ONE
      STO   PACK&1  PACK AND
      LD    STO&1  STORE 8-8
      A     ONE  LOADER CARDS
      STO   STO&1
      EOR   LAST
      8SC   Z
      LDX   PACK
ENO1  MDX   CARD2
      ORG   79
      DC    78
WC
*
*-----
*      CARD 2 STARTS HERE
*-----
*
RDIN  BSS   0
CARO2 LD    WC
STOWC STO  L  WC&78
      LD    STRD
      A     WC
      STO   STRD
      LD    STOWC&1
      A     WC
      STO   STOWC&1
      LD    WC
      SRA   1
      A     LAST
      STO   LAST
      LD    COUNT
      A     ONE
      STO   COUNT
      EOR   K0004
      BSC   Z
      MDX   SRTRD
      LDX   SRTR2
*
*-----
*      CONSTANTS AND BUCKETS
*-----
*
COUNT DC    0
K0004  DC    /0004
*
INPUT  EQU    /0010  CARD INPUT AREA
INWC   EQU    INPUT&72  WORD COUNT IN CARD
INWC&1 EQU    INWC&1
INAD   EQU    INPUT&74  ADDRESS IN CARD
INAD&1 EQU    INAD&1
STRD2  DC    INPUT-1
      DC    /4E00
```

3AD00700
3AD00710
3AD00720
3AD00730
3AD00740
3AD00750
3AD00760
3AD00770
3AD00780
3AD00790
3AD00800
3AD00810
3AD00820
3AD00830
3AD00840
3AD00850
3AD00860
3AD00870
3AD00880
3AD00890
3AD00900
3AD00910
3AD00920
3AD00930
3AD00940
3AD00950
3AD00960
3AD00970
3AD00980
3AD00990
3AD01000
3AD01010
3AD01020
3AD01030
3AD01040
3AD01050
3AD01060
3AD01070
3AD01080
3AD01090
3AD01100
3AD01110
3AD01120
3AD01130
3AD01140
3AD01150
3AD01160
3AD01170
3AD01180
3AD01190
3AD01200
3AD01210
3AD01220
3AD01230
3AD01240
3AD01250
3AD01260
3AD01270
3AD01280
3AD01290
3AD01300
3AD01310
3AD01320
3AD01330
3AD01340
3AD01350
3AD01360
3AD01370

0068 0 0000	CKSUM DC	0		3AD01380	0096 0 D0D8		STO	INCOL&1		3AD02060	
0069 0 4F01	REST2 DC	/4F01		3AD01390		*				3AD02070	
006A 0 0000	CDCNT DC	0		3AD01400	0097 0 C480 006E	CSLD	LD	I	INCOL	LOAD FIRST HALF WD	3AD02080
006B 0 000F	IPACK DC	INPUT-1		3AD01410	0099 0 1808		SRA	8		SHIFT	3AD02090
006C 0 0001	ONE2 DC	/0001		3AD01420	009A 0 F480 006F		EOR	I	INCOL&1	COMBINE SECONE HALF	3AD02100
	*			3AD01430	009C 0 80CB		A		CKSUM	ADD TO CHECKSUM	3AD02110
006D 0 0010	COL1 DC	/0010	INPUT AREA START	3AD01440	009D 0 D0CA		STO		CKSUM	STORE RESULT	3AD02120
006E 0 0000	INCOL DC	*-*	ADDR OF FIRST HALF WD	3AD01450		*					3AD02130
006F 0 0000	DC	*-*	ADDR OF SECOND HALF WD	3AD01460	009E 0 C0CF		LD		INCOL	*	3AD02140
0070 0 0000	ADDR DC	*-*	CURRENT CORE ADDR	3AD01470	009F 0 80D4		A		TWO	INCREMENT	3AD02150
0071 0 0000	WDCNT DC	*-*	WORD COUNT	3AD01480	00A0 0 D0CD		STO		INCOL	INPUT AREA	3AD02160
0072 0 005F	COL78 DC	INPUT&79	LAST CHECKSUM COL	3AD01490	00A1 0 80CA		A		ONE2	ADDRESSES	3AD02170
0073 0 FFFF	NONE DC	-1	NEGATIVE ONE	3AD01500	00A2 0 D0CC		STO		INCOL&1	*	3AD02180
0074 0 0002	TWO DC	/0002		3AD01510	00A3 0 F0CE		EOR		COL78	CHECK FOR LAST COL	3AD02190
0075 0 0086	INTE DC	INT4	INTERRUPT ENTRY	3AD01520	00A4 0 4820		BSC		Z	SKIP IF LAST COL	3AD02200
0076 0 004E	WC2 DC	/004E	WORD COUNT	3AD01530	00A5 0 70F1		MDX		CSLD	CONTINUE	3AD02210
0077 0 0003	K0003 DC	/0003		3AD01540		*					3AD02220
	-----			3AD01550	00A6 0 C0C1		LD		CKSUM	CHECK FOR VALID CHECKSUM	3AD02230
	* THE REMAINING INSTRUCTIONS LOAD			3AD01560	00A7 0 4820		BSC		Z	SHIP IF OK	3AD02240
	* THE PROGRAM DECK.			3AD01570	00A8 0 7001		MDX		*&1		3AD02250
	-----			3AD01580	00A9 0 7002		MDX		CSOK	BR TD MOVE ROUTINE	3AD02260
	* SRTR2 LD	INTE		3AD01590	00AA 0 30F7		WAIT		-9	CHECKSUM ERROR	3AD02270
0078 0 C0FC	STO	12	INTERRUPT VECTOR	3AD01600	00AB 0 70E5		MDX		CDOK	RETRY CHECKSUM	3AD02280
0079 0 D092	LD	COUNT-1	INITIALIZE LOADER	3AD01610		*					3AD02290
007A 0 C0E8	STO	/0050	RETURN POINT	3AD01620		*-----*					3AD02300
007B 0 D0D4	LD	WC2		3AD01630		* MOVE AND CHECK SECTION					3AD02310
007C 0 C0F9	STO	INPUT-1	WORD COUNT	3AD01640		* PACK EACH TWO COLUMNS INTO ONE WORD					3AD02320
007D 0 D091				3AD01650		* AND MOVE TO THE PROPER LOCATION.					3AD02330
	-----			3AD01660		* COMPARE WHAT WAS MOVED TO PACKED					3AD02340
	* CARD READ SECTION			3AD01670		* WORD.					3AD02350
	* READ PROGRAM CARDS INTO /0010 - /005F			3AD01680		*-----*					3AD02360
	-----			3AD01690	00AC 0 C0C0	CSOK	LD		COL1	SET	3AD02370
	* SRTR3 XIO	REST2-1	SENSE DSW	3AD01700	00AD 0 D0C0		STO		INCOL	INPUT AREA	3AD02380
007E 0 08E9	BSC	E	SKIP IF READY	3AD01710	00AE 0 80BD		A		ONE2	ADDRESSES	3AD02390
007F 0 4804	MDX	*&1		3AD01720	00AF 0 D0BF		STO		INCOL&1		3AD02400
0080 0 7001	MDX	*&2		3AD01730		*					3AD02410
0081 0 7002	WAIT	-8	NOT READY	3AD01740	00B0 0 C0A9		LD		INAD	SET	3AD02420
0082 0 30F8	MDX	*-6	LOOP	3AD01750	00B1 0 1808		SRA		8	CURRENT CORE	3AD02430
0083 0 70FA				3AD01760	00B2 0 F0A8		EOR		INAD1	LOCATION	3AD02440
	* XIO	STRD2	INITIATE READ	3AD01770	00B3 0 D0BC		STO		ADDR	FROM CARD	3AD02450
0084 0 08E1	BOSC	&-Z	UNCOND LEAVE INTERRUPT	3AD01780		*					3AD02460
0085 0 4878	DC	*-*	INTERRUPT ENTRY	3AD01790	00B4 0 C0A3		LD		INWC	SET NUMBER	3AD02470
0086 0 0000	XIO	REST2-1	SENSE RESET	3AD01800	00B5 0 1808		SRA		8	OF WORDS	3AD02480
0087 0 08E0	EOR	K0003	CHECK FOR CHANGES	3AD01810	00B6 0 F0A2		EOR		INWC1	TO BE MOVED	3AD02490
0088 0 F0EE	BOSC	&	SKIP IF ANY CHANGE	3AD01820	00B7 0 D0B9		STO		WDCNT		3AD02500
0089 0 4848	MDX	*-4	LOOP TIL OP COMP	3AD01830	00B8 0 C480 006E	MVLD	LD	I	INCOL	LOAD AND	3AD02510
008A 0 70FC				3AD01840	00BA 0 1808		SRA		8	PACK	3AD02520
	* XIO	REST2-1	SENSE DSW	3AD01850	00BB 0 F480 006F		EOR	I	INCOL&1	THE WORD	3AD02530
008B 0 08DC	SLA	2		3AD01860	00BD 0 D480 0070		STO	I	ADDR	STO AT CURRENT ADDRESS	3AD02540
008C 0 1002	BSC	-	SKIP IF ERROR	3AD01870	00BF 0 F480 0070		EOR	I	ADDR	COMPARE TO ACC	3AD02550
008D 0 4810	MDX	CDOK	BR ON NO ERROR	3AD01880	00C1 0 4820		BSC		Z	SKIP IF MOVE OK	3AD02560
008E 0 7002	WAIT	-11	2501 READ ERROR	3AD01890	00C2 0 7001		MDX		*&1	ERROR	3AD02570
008F 0 30F5	LDX	SRTR3	RETRY	3AD01900	00C3 0 7002		MDX		MVOK		3AD02580
0090 0 607E				3AD01910	00C4 0 30FC		WAIT		-4	MOVE ERROR	3AD02590
	-----			3AD01920	00C5 0 70F2		MDX		MVLD	RETRY MOVE	3AD02600
	* CHECKSUM SECTION			3AD01930		*					3AD02610
	* ADD COLUMNS 1-78 AND CHECK FOR ZERO			3AD01940	00C6 0 C0AA	MVOK	LD		WDCNT	CHECK IF ALL WORDS	3AD02620
	-----			3AD01950	00C7 0 80AB		A		NONE	MOVED	3AD02630
	* CDOK SLA	16	CLEAR CHECKSUM	3AD01960	00C8 0 D0A8		STO		WDCNT	DECREMENTED WORD COUNT	3AD02640
0091 0 1010	STO	COL1	SET UP	3AD01970	00C9 0 4820		BSC		Z	SKIP IF LAST WORD	3AD02650
0092 0 D0D5	LD	INCOL	INPUT AREA	3AD01980	00CA 0 7008		MDX		MVIN	BR TO INCR ADDR AND CONT	3AD02660
0093 0 C0D9	STO	ONE2	ADDRESSES	3AD01990		*					3AD02670
0094 0 D0D9	A			3AD02000		*-----*					3AD02680
0095 0 80D6				3AD02010		* END OF MOVE.					3AD02690
				3AD02020		* CHECK FOR END CARD AND REINITIALIZE					3AD02700
				3AD02030		* ADDR.					3AD02710
				3AD02040		*-----*					3AD02720
				3AD02050							3AD02730


```

*
00C8 0 C0A4      LD      ADDR      CHECK FOR LAST CARD
00CC 0 1806      SRA      6          ADDR LESS THAN 40
00CD 0 4820      BSC      Z          SKIP IF LAST CARD
00CE 0 70AF      MDX      SRTR3     8R TO READ NEXT CARD
00CF 0 C093      LD      COUNT-1   INITIALIZE LOADER
00D0 0 0400 0050 STO L /0050      RETURN POINT
00D2 0 6004      LDX      /0004     8R TO 8EGIN PROGRAM

*
00D3 0 C09A      MVIN     LD      INCOL INCREMENT
00D4 0 809F      A        TWO      INPUT AREA
00D5 0 D098      STO      INCOL     ADDRESSES
00D6 0 8095      A        ONE2
00D7 0 D097      STO      INCOL&1

*
00D8 0 C097      LD      ADDR      INCREMENT
00D9 0 8092      A        ONE2      CURRENT
00DA 0 D095      STO      ADDR      STORE ADDRESS
00DB 0 70DC      MDX      MVLD     8R TO MOVE NEXT WORD
00DC 0000      END      0
NO STATEMENTS FLAGGED IN THE ABOVE ASSEMBLY
```

3AD02740
3AD02750
3AD02760
3AD02770
3AD02780
3AD02790
3AD02800
3AD02810
3AD02820
3AD02830
3AD02840
3AD02850
3AD02860
3AD02870
3AD02880
3AD02890
3AD02900
3AD02910
3AD02920
3AD02930

```

C R O S S   R E F E R E N C E
NAME  VALUE  REFERENCES
ADDR  0070   0083,008D,008F,00CB,00D8,00DA
CARD2 0050   0049
CDCNT 006A
CDOK   0091   008E,00AB
CHKSM  002E   001C,001E,0025
CKSUM  0068   0092,009C,009D,00A6
COL1   006D   0093,00AC
COL78  0072   00A3
CON1   002F   0022
COUNT 0064   005D,005F,007A,00CF
CSLD   0097   00A5
CSOK   00AC   00A9
ENDUCK 0028
END1   0049
EOR     003A   0006,0007,0010,0040
INAD    005A   0080
INAD1   0058   0082
INCOL   006E   0094,0096,0097,009A,009E,00A0,00A2,00AD,00AF,0088,0088,00D3,00D5
          00D7
INPUT   0010   0066,0068,0072,007D
INT     0031   000C
INTE    0075   0078
INT4    0086   0075
INWC    0058   0084
INWC1   0059   0086
IPACK   006B
K0003   0077   0088
K0004   0065   0060
K0800   0029
K4001   002B   0009,0016
LAST    002C   0014,0015,0046,0058,005C
MVIN    00D3   00CA
MVLD    0088   00C5,00D8
MVOK    00C6   00C3
NONE    0073   00C7
ONE     0030   000F,0012,0020,003F,0041,0044,005E
ONE2    006C   0095,00A1,00AE,00D6,00D9
PACK    0037   0000,0002,0003,0013,0032,003E,0042,0048
RDIN    0050
RESET   002D   000A,0018,0034
REST2   0069   007E,0087,0088
SRTRD   0033   0028,0036,0062
SRTR2   0078   0063
SRTR3   007E   0090,00CE
START   0000
STO     003C   0004,0005,0011,0043,0045
STOWC   0051   0056,0058
STRD    002A   000E,0019,0033,0053,0055
STRD2   0066   0084
STRT    001C   001F,0021,0024,002F
TWO     0074   009F,00D4
WC      004F   001B,0050,0051,0054,0057,0059
WC2     0076   007C
WDCNT   0071   0087,00C6,00C8
```

END OF ASSEMBLY

----- LAST PAGE -----